SGC221116A

NOTICE OF MEETING

There will be a meeting of the
Senate Governance Committee
on Wednesday, November 16, 2022, at 2:00pm
LOCATION: Toldo Health Education Centre (Room 203)

AGENDA

1 Approval of Agenda

2 Approval of the minutes of the meeting of October 19, 2022 — SGC221019M

3 Business arising from the minutes

4 Outstanding Business

5 Reports/New Business

5.1 Programs, Faculty Complement, Enrolments, and Recruitment Initiatives Report — **Weir-Information** SGC221116-5.1

5.2 Report to on Renewal, Tenure, and Promotion — **Weir/Tam-Information** SGC221116-5.2

***5.3 Proposed Revisions to Bylaw 3** — **Dixon**-Approval SGC221116-5.3

5.4 Strategic Items for Senate Discussion — **Gordon**-Discussion SGC221116-5.4

5.5 Review of Research Institute: Cross-Border Institute and Diagnostic Imaging Institute — **Houser**-Discussion SGC221116-5.5

5.6 Honorary Degrees *(in-camera)* — **Robert Gordon**-Approval SGC211116-5.6
[to be distributed separately]

6 Question Period/Other Business

7 Adjournment

Please carefully review the 'starred' (*) agenda items. As per the June 3, 2004 Senate resolution, 'starred' items will not be discussed during a scheduled meeting unless a member specifically requests that a 'starred' agenda item be 'unstarred', and therefore open for discussion/debate. This can be done any time before (by forwarding the request to the secretary) or during the meeting. By the end of the meeting, agenda items which remain 'starred' (*) will be deemed approved or received.

University of Windsor
Senate Governance Committee

5.1: **Programs, Faculty Complement, Enrolments, and Recruitment Initiatives Report**

Item for: **Information**

At its June 2022 meeting, Senate requested a report in Fall 2022 on the five-year historical trends and future projections for (i) enrolment targets and outcomes, (ii) recruitment practices and investments, and (iii) faculty complement associated with program delivery including (iv) the identification of any program that relies on a single permanent member of the instructional community that would otherwise be discontinued or collapsed. In response to a clarification sought regarding what constitutes a program, Senate noted this includes single major and double major degrees, but does not include certificates (8-10 courses) or minors (6 courses).

Five-year historical enrolments and faculty complement are provided in the attached, as are recruitment activities and initiatives. A listing of programs by department is also attached. There are no programs that rely on a single permanent member of the instructional community.

As the official count date for enrolment numbers is November 1, 2022, Fall 2022 enrolment numbers will be added shortly.

Overall projected enrolment targets for Fall 2023 will be provided next semester, with the presentation of the budget to Senate.

Program Listing by Faculty/Department

FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES (FAHSS)
PROGRAMS ADMINISTERED BY THE OFFICE OF THE DEAN OF FAHSS
Honours Bachelor of Interdisciplinary Arts and Science (IAS)
Honours Bachelor of Interdisciplinary Arts and Science (IAS) Double Major Concentration
Honours Bachelor of Interdisciplinary Arts and Science (IAS) Major and Double Minor Concentration
General Liberal Arts and Professional Studies
Honours Liberal Arts and Professional Studies
Honours in Liberal Arts and Professional Studies: Aeronautics Leadership (Flight option)
General Liberal Arts and Professional Studies Degree Completion Program (for Lambton College Liberal Studies Graduates) (formerly General Arts and Science University (GASU))
Honours Liberal Arts and Professional Studies Degree Completion Program (for Lambton College Liberal Studies Graduates) (formerly General Arts and Science University (GASU))
General Liberal Arts and Professional Studies for Career Professionals Degree Completion Program (for Graduates of Qualifying CAAT (or equivalent) Diploma Programs)
General Liberal Arts and Professional Studies for Career Professionals Degree Completion Program (for Graduates of Qualifying CAAT (or equivalent) Advanced Diploma Programs)
Combined Honours in Social Justice
Argumentation Studies (PhD)

COMMUNICATION, MEDIA AND FILM
General Communication, Media and Film
Honours Communication, Media and Film
Combined Honours Communication, Media and Film
Honours Film Production (Bachelor of Fine Arts)
Concurrent General Bachelor of Arts (Communication, Media and Film)/Bachelor of Education
Master's in Communication and Social Justice (MA)

DRAMATIC ART
General Bachelor of Arts in Drama
Honours Bachelor of Arts in Drama
Honours Bachelor of Arts in Drama for Graduates of the Theatre Arts Ontario College Advanced Diploma
Honours Bachelor of Arts in Drama for Graduates of the Music Theatre Performance Ontario College Advanced Diploma
Honours Bachelor of Arts in Drama in Education and Community with concentration in Applied Theatre
Combined Honours Bachelor of Arts in Dramatic Art
Bachelor of Fine Arts (BFA) in Dramatic Art - Acting
Concurrent General Bachelor of Arts (Drama)/Bachelor of Education

ENGLISH AND CREATIVE WRITING
General English
Honours English
Honours English and Creative Writing
Combined Honours English
Combined Honours English and Creative Writing
Concurrent General Bachelor of Arts (English)/Bachelor of Education
Master's in English: Literature and Creative Writing (MA)
Master's in English: Literature and Language (MA)

HISTORY
BA General History
BA Honours History
Combined BA Honours History
Concurrent General Bachelor of Arts (History)/Bachelor of Education
Master's in History (MA)

LANGUAGES, LITERATURES AND CULTURES/LANGUES, LITTÉRATURES ET CULTURES (LLC)
GREEK AND ROMAN STUDIES
Honours Greek and Roman Studies (Greek or Latin Option)
Combined Honours Greek and Roman Studies1
FRENCH STUDIES
General Bachelor of Arts in French Studies
Honours Bachelor of Arts in French Studies
Combined Honours French Studies Programs
Concurrent General Bachelor of Arts (French Studies)/Bachelor of Education
MODERN LANGUAGES
Honours Modern Languages (with year abroad)
Honours Modern Languages and Second-Language Education
Combined Honours Modern Languages
Honours Modern Languages with Two Languages Option
Concurrent Honours Modern Languages with Second Language Education (Intercultural Stream)/Bachelor of Education

PHILOSOPHY
General Philosophy
Honours Philosophy
Combined Honours Philosophy Programs
Master of Philosophy (MA)

POLITICAL SCIENCE
General Political Science
Honours Political Science
Honours Political Science (with Thesis)
Honours Political Science with French Specialization
Honours Political Science with French Specialization and Thesis
Honours Law and Politics
Honours Law and Politics (with Thesis)
Honours International Relations and Development Studies
Honours International Relations and Development Studies (with Thesis)
Combined Honours Political Science Programs
Combined Honours Political Science Programs with Thesis in Political Science
Honours Business Administration and Political Science (with/without thesis)
Honours Business Administration and Political Science with Human Resources Specialization) (with/without thesis)
Concurrent General Bachelor of Arts (Political Science)/Bachelor of Education
Master of Arts in Political Science (MA)

PSYCHOLOGY
General Psychology
General Child Psychology
Honours Psychology
Honours Psychology with Thesis
Honours Psychology – Interdisciplinary Health Stream

Honours Developmental Psychology
Honours Developmental Psychology with Thesis
BSc Honours Program in Behaviour, Cognition and Neuroscience (with/without thesis)
Combined Honours Psychology Programs
Combined Honours Programs in Psychology with Thesis
Combined Honours Programs in Developmental Psychology
Combined Honours Programs in Developmental Psychology with Thesis
Concurrent General Bachelor of Arts (Psychology)/Bachelor of Education/Diploma in Early Childhood Education
General Psychology for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates – Degree Completion Pathway
General Child Psychology for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates – Degree Completion Pathway
Honours Psychology for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates – Degree Completion Pathway
Honours Psychology with Thesis for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates- Degree Completion Pathway
Honours Developmental Psychology for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates – Degree Completion Pathway
Honours Developmental Psychology with Thesis for Ontario College Child and Youth Care (formerly Child and Youth Worker) Program Graduates – Degree Completion Pathway
Bachelor of Arts in Psychology (Honours) with Autism and Behavioural Sciences (ABS) Post-Graduate Certificate program from Fanshawe College, Lambton College or St. Clair College
Bachelor of Arts in Developmental Psychology (Honours) with Autism and Behavioural Sciences (ABS) Post-Graduate Certificate program from Fanshawe College, Lambton College or St. Clair College
BA Honours in Disability Studies
Combined Honours BA in Disability Studies
Combined Honours BA in Disability Studies and Psychology
Honours Bachelor of Social Work and Disability Studies
BA Honours Bachelor of Arts in Disability Studies for Ontario College Child and Youth Care (formerly Child and Youth Worker) - Degree Completion Pathway
Honours Bachelor of Arts in Disability Studies for College of Applied Arts and Technology Graduates - Degree Completion Pathway
Bachelor of Commerce (Honours Business Administration and Psychology) (with/without thesis)
Bachelor of Commerce (Honours Business Administration and Psychology) with Specialization in Human Resources Management and Industrial Organizational Psychology (with/without thesis)
Clinical Psychology (MA and PhD)
Applied Social Psychology (MA and PhD)

SCHOOL OF CREATIVE ARTS
Bachelor of Fine Arts in Film Production
Honours Bachelor of Arts in Music
Honours Bachelor of Music (Music Education Stream)
Honours Bachelor of Music (Comprehensive Stream)
Combined BA Honours Music Programs
Concurrent Bachelor of Music (Honours Music Education)/ Bachelor of Education
General BA in Visual Arts
BA Honours in Media Arts and Culture
Combined BA Honours Visual Arts Programs
Bachelor of Fine Arts in Visual Arts
Bachelor of Fine Arts in Visual Arts and the Built Environment (VABE)
Concurrent General Bachelor of Arts (Visual Art)/Bachelor of Education
Master of Fine Arts in Film and Media Arts (MFA)
Master of Fine Arts in Visual Arts (MFA)

SOCIAL WORK
Honours Bachelor of Social Work
Honours Bachelor of Social Work and Disability Studies
Honours Bachelor of Social Work and Women's Studies
Honours Bachelor of Social Work for University Graduates
Honours Bachelor of Social Work for Ontario Child and Youth Care Program Graduates
BA Honours in Disability Studies
Combined Honours BA in Disability Studies and Psychology
Combined Honours BA in Disability Studies
BA Honours Bachelor of Arts in Disability Studies for Ontario College Child and Youth Care Program Graduates - Degree Completion Pathway
Honours Bachelor of Arts in Disability Studies for College of Applied Arts and Technology Graduates - Degree Completion Pathway
WOMEN'S AND GENDER STUDIES
General BA in Women's and Gender Studies
BA Honours in Women's and Gender Studies
Combined Honours in Women's and Gender Studies
Combined Honours Women's and Gender Studies when taken with Criminology
Honours Business Administration and Women's and Gender Studies (with/without thesis)
Honours Bachelor of Social Work and Women's Studies
PhD in Social Work
Master of Social Work (MSW)
Master of Social Work for Working Professionals (MSW)

SOCIOLOGY AND CRIMINOLOGY
Honours Criminology
Combined Honours Criminology Programs
General Family and Social Relations
Honours Family and Social Relations
Combined Honours Family and Social Relations
General Sociology
Honours Sociology
Combined Honours Sociology Programs
Combined Honours in Sociology and Criminology
Master of Arts in Criminology (MA)
Master of Arts in Sociology (MA)
Social Data Analysis (MA) (Joint Program with Psychology)
PhD in Sociology with Specialization in Social Justice

ODETTE SCHOOL OF BUSINESS
Honours Business Administration (with/without Thesis)
Honours Business Administration Co-operative Education Program (with/without Thesis)
Honours Business Administration with Specialization in Accounting (with/without Co-op and with/without Thesis)
Honours Business Administration with Specialization in Human Resources (with/without Co-op and with/without Thesis)
Honours Business Administration with Specialization in Finance (with/without Co-op and with/without Thesis)
Honours Business Administration with Specialization in Supply Chain and Business Analytics (with/without Co-op and with/without Thesis)
Honours Business Administration with Specialization in Marketing (with/without Co-op and with/without Thesis)
Honours Business Administration with Specialization in Strategy and Entrepreneurship (with/without Co-op and with/without Thesis)

Honours Business Administration with Specialization in International Business (with/without Thesis) (with/without Co-op)
Honours Business Administration and Computer Science (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Accounting (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Human Resources (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Finance (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Supply Chain and Business Analytics (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Marketing (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Strategy and Entrepreneurship (with/without Co-op and with/without Thesis)
Honours Business Administration and Economics (with/without Thesis)
Honours Business Administration and Economics with Specialization in Accounting (with/without Thesis)
Honours Business Administration and Economics with Specialization in Human Resources (with/without Thesis)
Honours Business Administration and Economics with Specialization in Finance (with/without Thesis)
Honours Business Administration and Economics with Specialization in Supply Chain and Business Analytics (with/without Thesis)
Honours Business Administration and Economics with Specialization in Marketing (with/without Thesis)
Honours Business Administration and Economics with Specialization in Strategy and Entrepreneurship (with/without Thesis)
Honours Business Administration and Mathematics (with/without Thesis)
Business Administration and Mathematics with Specialization in Supply Chain and Business Analytics (with/without Thesis)
Honours Business Administration and Mathematics with Specialization in Finance (with/without Thesis)
Honours Mathematics with Finance Concentration
Honours Business Administration and Political Science (with/without thesis)
Honours Business Administration and Political Science with Specialization in Human Resources) (with/without thesis)
Honours Business Administration and Psychology (with/without thesis)
Honours Business Administration and Psychology with Specialization in Human Resources Management and Industrial Organizational Psychology (with/without thesis)
Honours Business Administration and Women's and Gender Studies (with/without thesis)
Honours Business Administration for Baccalaureate Degree Holders
Honours Business Administration for 3-year CAAT (or equivalent) Diploma Holders in any area other than Business
Honours Business Administration for 3-year CAAT (or equivalent) Diploma Holders in any area in Business
Honours Business Administration for 2 year CAAT (or equivalent) Diploma Holders in any area in Business
Bachelor of Commerce (Honours Business Administration) Program for 3-year Diploma Holders in Accounting from St. Clair College
Fast-Track Honours Business Administration Program for 3-year CAAT (or equivalent) Diploma Holders in any area in Business
Fast-Track (Honours Business Administration) Program for 3-year Diploma Holders in Accounting from St. Clair College
Fast-Track Honours Business Administration Program for 3-year Diploma Holders in Human Resources from St. Clair College
Fast-Track Honours Business Administration Program for 3-year Diploma Holders in Marketing from St. Clair College
Fast-Track Honours Business Administration Program for 3-year CAAT (or equivalent) Diploma Holders in Finance
Honours Business Administration for Students from Southwestern University Finance and Economics, China
Honours Business Administration (with/without thesis; with/without co-op, and with any specialization) for students from the Global Institute of Management and Economics (GIME) of Dongbei University of Finance and Economics

Honours Business Administration for students from Chitkara University, Punjab
Master of Business Administration (MBA)
Master of Business Administration with Professional Accounting Specialization (MBA) Fast Track
Master of Business Administration (MBA) (For Managers and Professionals)
Master of Business Administration/Juris Doctor (MBA/JD)
Master of Management (MOM)
Master of Engineering Management (MEM) (Joint Program with Engineering)
Master of Business Administration/Doctor of Medicine (MBA/MD) (Concurrent Program with Schulich School of Medicine)

FACULTY OF EDUCATION
Consecutive Bachelor of Education
Bachelor of Education in Technological Studies/Diploma in Education - Technological Studies
Concurrent Bachelor of Music (Honours Music Education)/ Bachelor of Education
Concurrent Honours Modern Languages with Second Language Education (Intercultural Stream)/Bachelor of Education
Concurrent General Bachelor of Arts (Communication, Media and Film)/Bachelor of Education
Concurrent General Bachelor of Arts (Drama)/Bachelor of Education
Concurrent General Bachelor of Arts (English)/Bachelor of Education
Concurrent General Bachelor of Arts (French Studies)/Bachelor of Education
Concurrent General Bachelor of Arts (History)/Bachelor of Education
Concurrent General Bachelor of Arts (Political Science)/Bachelor of Education
Concurrent General Bachelor of Arts (Psychology)/Bachelor of Education/Diploma in Early Childhood Education
Concurrent General Bachelor of Arts (Visual Arts)/Bachelor of Education
Concurrent General Bachelor of Science (General Science)/ Bachelor of Education
Concurrent General Bachelor of Mathematics/Bachelor of Education
Concurrent Bachelor of Arts/Bachelor of Education/Diploma in Early Childhood Education - Pre-Service Program
Master of Education (MEd)
PhD in Educational Studies (PhD) (Joint Program with Brock, Lakehead and Windsor)

FACULTY OF ENGINEERING
PROGRAMS ADMINISTERED BY THE OFFICE OF THE DEAN OF ENGINEERING
Bachelor of Engineering Technology
Bachelor of Engineering Technology (BEngTech) - General Stream
Bachelor of Engineering Technology (BEngTech) – Biomedical Stream
Bachelor of Engineering Technology (BEngTech) - Mechanical Stream
Bachelor of Engineering Technology (BEngTech) - Civil Stream
Bachelor of Engineering Technology (BEngTech) – Mechatronics Stream

CIVIL AND ENVIRONMENTAL ENGINEERING
Bachelor of Applied Science in Civil Engineering
Bachelor of Applied Science in Environmental Engineering
Bachelor of Applied Science in Civil Engineering for Graduates of St. Mary's University Diploma of Engineering
Civil Engineering (MASc)
International Master of Applied Science (MASc/Laurea Magistrale) in Civil Engineering with University of Udine, Italy (Dual Degree Program)
Civil Engineering (MEng) (with/without Co-op/Internship Option)
Civil Engineering (PhD)
Environmental Engineering (MASc)
Environmental Engineering (MEng) (with/without Co-op/Internship Option)
Environmental Engineering (PhD)

ELECTRICAL AND COMPUTER ENGINEERING
Bachelor of Applied Science in Electrical Engineering
Electrical Engineering (MASc)
Electrical Engineering (MEng) (Co-op/Internship Option)
Electrical Engineering (Computer Engineering Field) (MEng)Electrical Engineering (PhD)

MECHANICAL, AUTOMOTIVE, AND MATERIALS ENGINEERING
Bachelor of Applied Science in Industrial Engineering (General Program)
Bachelor of Applied Science in Industrial Engineering - Minor in Business Administration Option
Bachelor of Applied Science in Mechanical Engineering
Bachelor of Applied Science in Mechanical Engineering with Aerospace Option
Bachelor of Applied Science in Mechanical Engineering with Automotive Option
Bachelor of Applied Science in Mechanical Engineering with Environmental Option
Bachelor of Applied Science in Mechanical Engineering with Materials Option
Bachelor of Applied Science in Mechanical Engineering Articulation Agreement with St. Mary's University Diploma of Engineering
Bachelor of Applied Science in Mechanical Engineering with Automotive Option Articulation Agreement with St. Mary's University Diploma of Engineering
Bachelor of Applied Science in Mechanical Engineering with Environmental Option Articulation Agreement with St. Mary's University Diploma of Engineering
Bachelor of Applied Science in Mechanical Engineering with Materials Option Articulation Agreement with St. Mary's University Diploma of Engineering
Engineering Materials (MASc)
Engineering Materials (MEng)
Engineering Materials (PhD)
Mechanical Engineering (MASc)
Mechanical Engineering (MEng) (with/without Co-op/Internship Option)
Mechanical Engineering (PhD)
Automotive Engineering (MASc/Laurea Magistrale) (International Master of Engineering with Politecnico di Torino (Dual Degree Program))
Materials Chemistry and Engineering (MEMC) (Joint with Chemistry)
Industrial Engineering (MASc)
Industrial Engineering (MEng) (with/without Co-op Internship/Option)Industrial and Manufacturing Systems Engineering (PhD) (Multi-Disciplinary Program)

FACULTY OF HUMAN KINETICS
Bachelor of Human Kinetics (Honours Kinesiology - Movement Science)
Bachelor of Human Kinetics (Honours Sport Management and Leadership)
Bachelor of Human Kinetics (Honours Sport Management and Leadership) for Graduates of Lambton College's Three-Year Sport and Recreation Management Program
Bachelor of Human Kinetics (Honours Sport Management and Leadership) for Graduates of Durham College's Three-Year Advanced Diploma in Sport Management Program
Bachelor of Human Kinetics (Honours Sport Management and Leadership) for Graduates of St. Clair College's Three-Year Sport and Recreation Management Program
Bachelor of Human Kinetics (Honours Kinesiology - Movement Science) for Graduates of St. Clair College's Two-year Fitness and Health Promotion Program
Bachelor of Human Kinetics (Honours Kinesiology – Movement Science) for Graduates of Fanshawe College’s Two-Year Fitness and Health Promotion Program
Bachelor of Human Kinetics (Honours Kinesiology - Movement Science) for Graduates of Lambton College of Applied Arts and Technology’s Massage Therapy Program
Bachelor of Human Kinetics for Graduates of Fanshawe College’s Recreation and Leisure Services Program
Master of Human Kinetics (MHK)
Master of Sport Management and Leadership (MSML)
PhD in Kinesiology

FACULTY OF LAW
Juris Doctor
Concurrent Juris Doctor/Juris Doctor with University of Detroit Mercy
Concurrent MBA/JD
Concurrent MSW/JD
Master of Laws

NURSING
Honours Bachelor of Science in Nursing
BScN Program for Graduates of Lambton College's and St. Clair College's Practical Nursing Programs – Degree Completion Pathway
PhD in Nursing
Master of Science in Nursing (MScN)
Master of Nursing (MN) Advanced Clinical Practice and Leadership in Nursing Fields
Master of Nursing (MN) Primary Health Care Nurse Practitioner

FACULTY OF SCIENCE 529
PROGRAMS ADMINISTERED BY THE OFFICE OF THE DEAN OF SCIENCE
Bachelor of Science (General Science)
Bachelor of Science (General Science) for Graduates of a College Diploma Program in Medical Laboratory Technology
Concurrent General Bachelor of Science (General Science)/ Bachelor of Education
Honours Bachelor of Forensic Science (BFS)
Combined Bachelor of Arts in Forensics
Combined Bachelor of Arts in Forensics and Criminology (Applied Forensic Science Stream) - Degree Completion Pathway
Environmental Science (MSc)
Environmental Science (PhD)

BIOMEDICAL SCIENCES
Honours Biomedical Science
Honours Biochemistry and Biomedical Science (Health Stream)
PhD in Biological Science (PhD) (Joint with Integrative Biology)
Master's in Biological Sciences (MSc) (Joint with Integrative Biology)
Master of Science (MSc) in Translational Health Sciences (THS)

CHEMISTRY AND BIOCHEMISTRY
Honours Chemistry
Honours Chemistry with Thesis
Honours Chemistry (Applied Chemistry Stream)
Combined Honours Chemistry Programs
Honours Biochemistry
Honours Biochemistry with Thesis
Honours Biochemistry and Biomedical Science (Health Stream)
Combined Honours Biochemistry Programs
Chemistry and Biochemistry (MSc)
Medical Biotechnology (MMB)
Master of Materials Chemistry and Engineering (MMCE) (Joint Program with Engineering)
Chemistry and Biochemistry (PhD)

COMPUTER SCIENCE
Bachelor of Computer Science (General)
Bachelor of Computer Science (Honours)
Bachelor of Computer Science (Honours Applied Computing)
Bachelor of Science (Honours Computer Information Systems)
Bachelor of Science (Honours Computer Science with Software Engineering Specialization)
Honours Business Administration and Computer Science (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Accounting (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Human Resources (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Finance (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Supply Chain and Business Analytics (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Marketing (with/without Co-op and with/without Thesis)
Honours Business Administration and Computer Science with Specialization in Strategy and Entrepreneurship (with/without Co-op and with/without Thesis)
Honours Mathematics and Computer Science
Combined Honours Computer Science Programs
Bachelor of Computer Science (General) for University Graduates
Bachelor of Computer Science (Honours) for University Graduates
Bachelor of Computer Science (Honours Applied Computing) for University Graduates
Bachelor of Computer Science (General) for Graduates of Qualifying Ontario and Other College Diploma Holders
Bachelor of Computer Science (Honours Applied Computing) (with and without Co-op) for Qualifying Ontario and Other College Diploma Holders
Bachelor of Computer Science (General) for Qualifying Ontario CAAT (or equivalent) Students with 2 Years of Study at CAAT (or equivalent) Diploma Program
Bachelor of Computer Science (Honours Applied Computing) (Co-op) for Qualifying Ontario CAAT (or equivalent) Students with 2 Years of Study at CAAT (or equivalent) Diploma Program
Master of Applied Computing (MAC)
Master of Science in Computer Science (MSc)
Master of Science in Computer Science (MSc) - Artificial Intelligence Stream
PhD in Computer Science (PhD)

ECONOMICS
General Bachelor of Arts in Economics
Honours Bachelor of Arts in Economics
Honours Bachelor of Arts in Economics (Applied Economics and Policy Stream)
Honours Bachelor of Science in Economics
Combined Honours Bachelor of Arts in Economics Programs
Combined Honours Bachelor of Science in Economics Programs
Honours Business Administration and Economics (with/without Thesis)
Honours Business Administration and Economics with Specialization in Accounting (with/without Thesis)
Honours Business Administration and Economics with Specialization in Human Resources (with/without Thesis)
Honours Business Administration and Economics with Specialization in Finance (with/without Thesis)
Honours Business Administration and Economics with Specialization in Supply Chain and Business Analytics (with/without Thesis)
Honours Business Administration and Economics with Specialization in Marketing (with/without Thesis)
Honours Business Administration and Economics with Specialization in Strategy and Entrepreneurship (with/without Thesis)
Master of Economics (MA)
Master of Applied Economics and Policy (MAEP)

SCHOOL OF THE ENVIRONMENT
BSc Honours Environmental Science
BSc Honours Environmental Science (with Thesis)
BSc Honours Environmental Science (Applied Environmental Science Stream)
Honours Bachelor of Environmental Studies (BES)
Earth Sciences (MSc)
Earth Sciences (PhD)

INTEGRATIVE BIOLOGY
Honours Biological Sciences
Honours Biological Sciences with Thesis
Honours Biological Sciences - Interdisciplinary Health Science (HIS) Stream
BSc Honours in Behaviour, Cognition and Neuroscience (with Thesis)
BSc Honours in Behaviour, Cognition and Neuroscience (without Thesis)
Combined Honours Biological Sciences Programs
PhD in Biological Science (PhD) (Joint with Biomedical Sciences)
Master's in Biological Sciences (MSc) (Joint with Biomedical Sciences)

MATHEMATICS AND STATISTICS
General Mathematics
Honours Mathematics
Honours Mathematics and Statistics
Honours Mathematics and Computer Science
Honours Mathematics with Finance Concentration
Honours Actuarial Science
Combined Honours Mathematics Programs
Concurrent Bachelor of Mathematics (General)/Bachelor of Education
Honours Business Administration and Mathematics (with/without thesis)
Honours Business Administration and Mathematics with Specialization in Supply Chain and Business Analytics (with/without Thesis)
Honours Business Administration and Mathematics with Specialization in Finance (with/without thesis)
Mathematics and Statistics (MSc) (Mathematics Field)
Mathematics and Statistics (MSc) (Statistic Field)
Master of Actuarial Science (MActSc)
Mathematics and Statistics (PhD)

PHYSICS
Honours Physics (with/without Co-op)
Honours Physics with Thesis (with/without Co-op)
Honours Physics (Medical Physics) (with/without Co-op)
Honours Physics (Medical Physics with Thesis) (with/without Co-op)
Combined Honours Physics Programs
Honours Certificate in Physics
Master of Science (MSc)
Doctor of Philosophy (PhD)

University of Windsor

Number of faculty 2017 to 2021

		Year				
FACULTY	**DEPARTMENT**	**2017**	**2018**	**2019**	**2020**	**2021**
FACULTY OF ARTS, HUMANITIES, AND SOCIAL SCIENCES	COMMUNICATION, MEDIA AND FILM	16	17	16	12	14
	ENGLISH AND CREATIVE WRITING	18	18	20	18	18
	FACULTY OF ARTS, HUMANITIES, AND SOCIAL SCIENCES	6	6	4	3	3
	HISTORY	12	12	11	11	10
	LANGUAGES, LITERATURES & CULTURES	15	15	15	15	15
	PHILOSOPHY	13	13	13	12	11
	POLITICAL SCIENCE	14	15	15	15	17
	PSYCHOLOGY	30	32	34	33	34
	SCHOOL OF CREATIVE ARTS	19	22	21	21	21
	SCHOOL OF DRAMATIC ART	11	11	11	11	11
	SCHOOL OF SOCIAL WORK	28	30	33	33	34
	SOCIOLOGY, ANTHROPOLOGY AND CRIMINOLOGY	22	22	21	21	17
FACULTY OF ARTS, HUMANITIES, AND SOCIAL SCIENCES Total		**204**	**213**	**214**	**205**	**205**
FACULTY OF EDUCATION	FACULTY OF EDUCATION	28	25	26	25	26
FACULTY OF EDUCATION Total		**28**	**25**	**26**	**25**	**26**
FACULTY OF ENGINEERING	CIVIL & ENVIRONMENTAL ENGINEERING	17	19	20	20	19
	ELECTRICAL & COMPUTER ENGINEERING	20	21	22	24	25
	FACULTY OF ENGINEERING	8	7	7	7	7
	MECHANICAL, AUTOMOTIVE & MATERIALS ENGINEERING	44	46	47	46	44
FACULTY OF ENGINEERING Total		**89**	**93**	**96**	**97**	**95**
FACULTY OF HUMAN KINETICS	FACULTY OF HUMAN KINETICS	2	1	1		1
	KINESIOLOGY	25	26	26	27	26
FACULTY OF HUMAN KINETICS Total		**27**	**27**	**27**	**27**	**27**
FACULTY OF LAW	FACULTY OF LAW	33	34	36	34	33
FACULTY OF LAW Total		**33**	**34**	**36**	**34**	**33**
FACULTY OF NURSING	FACULTY OF NURSING	25	27	26	26	27
FACULTY OF NURSING Total		**25**	**27**	**26**	**26**	**27**
FACULTY OF SCIENCE	BIOLOGICAL SCIENCES	28	27			
	BIOMEDICAL SCIENCES			11	12	12
	CHEMISTRY & BIOCHEMISTRY	24	25	25	28	28
	EARTH & ENVIRONMENTAL SCIENCES	15	17			
	ECONOMICS	12	13	12	11	11
	FACULTY OF SCIENCE	2	2			
	INTEGRATIVE BIOLOGY			16	16	16
	MATHEMATICS & STATISTICS	14	14	16	16	16
	PHYSICS	7	8	9	9	8
	SCHOOL OF COMPUTER SCIENCE	22	22	22	26	31
	SCHOOL OF THE ENVIRONMENT			22	21	22
	GREAT LAKES INSTITUTE	8	8	7	5	7
FACULTY OF SCIENCE Total		**132**	**136**	**140**	**144**	**151**
ODETTE SCHOOL OF BUSINESS	ODETTE SCHOOL OF BUSINESS	63	70	64	64	65
ODETTE SCHOOL OF BUSINESS Total		**63**	**70**	**64**	**64**	**65**
Grand Total		**601**	**625**	**629**	**622**	**629**

University of Windsor

Fall Full and Part Time Headcount

		UNDERGRADUATE									
		Fall 2017		Fall 2018		Fall 2019		Fall 2020		Fall 2021	
FACULTY	**BAU**	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
FAHSS	Arts, Humanities, Social Science	444	169	409	158	359	128	295	118	215	103
	Communication, Media and Film	239	42	241	45	222	42	190	40	194	32
	Dramatic Art	183	23	154	17	149	12	138	20	110	12
	English Language and Literature	200	33	191	36	209	39	185	42	174	42
	History	133	21	128	23	130	22	131	29	121	35
	Languages, Literature and Culture	152	33	147	20	137	27	143	27	143	22
	Philisophy	20	14	19	10	22	5	21	7	24	6
	Political Science	295	53	301	54	299	41	278	52	261	48
	Psychology	822	193	817	184	877	140	884	197	914	199
	Sociology, Anthropology, Criminology	702	95	697	124	697	115	675	118	610	123
	Creative Arts	197	44	227	38	220	33	213	40	200	38
	Social Work	394	65	376	55	407	78	395	81	373	65
Total FAHSS	**Total FAHSS**	3,780	783	3,706	762	3,728	679	3,546	768	3,338	723
Business	Business	1,100	218	1,036	259	1,002	224	981	211	960	210
Total Business	**Total Business**	1,100	218	1,036	259	1,002	224	981	211	960	210
Education	Education	325	0	435	0	554	3	660	4	693	6
Total Education	**Total Education**	325	0	435	0	554	3	660	4	693	6
Engineering	Civil and Environmental Engineering	183	49	170	38	143	46	127	62	155	39
	Electrical Engineering	265	72	266	83	238	78	245	81	239	81
	Engineering	82	3	116	17	111	17	130	33	104	23
	Engineering Materials	-	-	-	-	-	-	-	-	-	-
	Industrial Engineering	-	-	-	-	-	-	-	-	-	-
	Mechanical, Automotive, and Materials Engineering	650	155	637	158	586	180	489	164	447	153
Total Engineering	**Total Engineering**	1,180	279	1,189	296	1,078	321	991	340	945	296
Human Kinetics	Human Kinetics	708	56	692	55	693	56	698	56	685	66
Total Human Kinetics	**Total Human Kinetics**	708	56	692	55	693	56	698	56	685	66
Law	Law	709	4	709	3	732	4	722	-	703	1
Total Law	**Total Law**	709	4	709	3	732	4	722	-	703	1
Nursing	Nursing	891	44	909	24	883	45	905	17	893	29
Total Nursing	**Total Nursing**	891	44	909	24	883	45	905	17	893	29
Science	Biology	607	88	604	72	591	65	461	67	465	59
	Chemistry	333	44	310	46	332	45	195	35	177	41
	Earth and Environmental Science	97	18	95	10	96	23	98	20	113	16
	Economics	103	27	93	15	84	22	78	30	88	23
	Mathematics and Statistics	70	13	89	17	94	13	120	11	105	16
	Physics	62	4	58	4	59	6	64	9	54	11
	Science	121	15	124	13	145	14	190	14	180	19
	Computer Science	456	107	524	137	646	122	709	178	738	175
	BIOMEDICAL	-	-	-	-	-	-	356	9	456	17
Total Science	**Total Science**	1,849	314	1,896	312	2,047	309	2,270	372	2,375	376
GRAND TOTAL		**10,542**	**1,697**	**10,572**	**1,711**	**10,716**	**1,640**	**10,772**	**1,768**	**10,591**	**1,707**

University of Windsor

Fall Full and Part Time Headcount

		GRADUATE									
		Fall 2017		Fall 2018		Fall 2019		Fall 2020		Fall 2021	
FACULTY	**BAU**	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time	Full-time	Part-time
FAHSS	Arts, Humanities, Social Science	4	1	6	-	8	-	10	-	11	1
	Communication, Media and Film	15	-	12	-	13	-	14	-	12	-
	Dramatic Art	-	-	-	-	-	-	-	-	-	-
	English Language and Literature	14	1	19	2	23	-	15	1	20	-
	History	20	-	14	-	16	-	20	-	17	-
	Languages, Literature and Culture	-	-	-	-	-	-	-	-	-	-
	Philisophy	12	1	13	1	13	1	11	-	8	-
	Political Science	35	-	30	-	25	-	28	-	34	-
	Psychology	97	-	95	-	85	1	90	-	96	1
	Sociology, Anthropology, Criminology	46	-	47	-	51	-	36	-	43	-
	Creative Arts	18	-	18	-	22	-	13	-	10	-
	Social Work	411	-	381	-	433	-	481	1	495	-
Total FAHSS	**Total FAHSS**	672	3	635	3	689	2	718	2	746	2
Business	Business	465	-	447	-	444	-	456	3	568	-
Total Business	**Total Business**	465	-	447	-	444	-	456	3	568	-
Education	Education	128	35	126	38	155	33	152	32	196	6
Total Education	**Total Education**	128	35	126	38	155	33	152	32	196	6
Engineering	Civil and Environmental Engineering	159	6	208	10	213	7	280	3	360	-
	Electrical Engineering	404	4	559	5	532	6	611	9	766	-
	Engineering	24	-	22	-	29	-	16	-	39	-
	Engineering Materials	32	2	41	1	33	3	25	1	-	-
	Industrial Engineering	-	-	-	-	23	2	18	1	-	-
	Mechanical, Automotive, and Materials Engineering	789	6	954	7	940	3	1,000	3	1,061	2
Total Engineering	**Total Engineering**	1,408	18	1,784	23	1,770	21	1,950	17	2,226	2
Human Kinetics	Human Kinetics	81	-	69	-	78	-	70	-	79	-
Total Human Kinetics	**Total Human Kinetics**	81	-	69	-	78	-	70	-	79	-
Law	Law	4	-	5	-	5	-	10	-	8	-
Total Law	**Total Law**	4	-	5	-	5	-	10	-	8	-
Nursing	Nursing	84	43	77	39	90	24	75	16	104	1
Total Nursing	**Total Nursing**	84	43	77	39	90	24	75	16	104	1
Science	Biology	43	1	63	1	74	1	75	1	68	-
	Chemistry	156	-	188	-	194	-	231	-	261	-
	Earth and Environmental Science	12	-	17	-	14	-	15	-	14	-
	Economics	101	-	98	-	72	-	63	-	56	-
	Mathematics and Statistics	72	-	74	-	68	-	57	-	58	-
	Physics	13	-	12	-	8	-	9	-	13	-
	Science	48	-	37	-	36	-	35	-	31	-
	Computer Science	249	2	303	-	357	1	388	7	497	-
	BIOMEDICAL	-	-	-	-	-	-	-	-	-	-
Total Science	**Total Science**	694	3	792	1	823	2	873	8	998	-
GRAND TOTAL		**3,536**	**102**	**3,934**	**104**	**4,053**	**82**	**4,304**	**78**	**4,925**	**11**

Recruitment Activities and Initiatives

[1] Enrolment Intelligence – Applicant Decline Survey and Early Leavers research

The Applicant Decline Survey measures up to fifty different factors to provide a comprehensive understanding of what matters to our applicants, why they elected to decline our offer of admission and where they went instead. Information collected is presented and shared annually with our faculties, enrolment partners, and marketing and recruitment professionals to inform our collective recruitment efforts better.

An early leaver is an undergraduate student registered at the University of Windsor but did not complete their program. Last year, the University wondered if we could learn more about why these individuals did not return to their post-secondary studies and conducted the Academic Group to develop and conduct the study. Challenges reported included difficulties managing their course load, understanding materials in their courses, being unprepared academically, and balancing the university and external pressures, such as work, family and financial responsibilities. The results of this pilot study were shared with the faculties and recruitment partners. This survey is being conducted again to understand better the challenges early leavers face outside their pandemic experience.

[2] High school engagement (*a return to in-person events*)

A hectic schedule of 900+ high school visits, education fairs, and online information events is well underway, with recruitment staff travelling locally, across Ontario, and globally to promote the University of Windsor and generate Lancer pride, leads, and applications.

This year's team has a wide range of academic backgrounds, but they are united in their intense passion for UWindsor and excellent communication skills. Recruiters will connect with students at schools into late November. A primary objective is to motivate participants to share their contact information so that representatives of the University may continue the conversation.

With the support of campus partners, the recruitment team is offering prospective students an opportunity to win a free first term — tuition, books, residence, and a meal plan — to maximize the chance to collect lead data.

Through December and January, they will shift gears to assist with the application process at schools, online, and at the Welcome Centre, providing support for anyone needing help completing their application.

[3] GTHA and Transfer engagement

The best opportunities to achieve the University of Windsor's undergraduate new and transfer student enrolment priorities exist within the rapidly growing Greater Toronto and Hamilton Area (GTHA). Admittedly, progress in the highly competitive GTHA requires a different level of effort and investment than has been the case in recent years (Black, 2016).

To increase market share among GTHA students from high school and strategic college partners, the University funded the creation of a new enrolment advisor (a.k.a. Student Recruitment Officer) to focus exclusively on building relationships with GTHA feeder high schools and colleges to support prospects and applicants from the associated territory.

As such, we are pleased to introduce Jessica Hardwick as our new Enrolment Advisor in Toronto. She grew up in Brampton and worked at Toronto Metropolitan University for several years as a recruiter for the past three years with their national team. She graduated with a BA in Arts and Contemporary Studies in 2016 and was a member of the Varsity Hockey program, holding various leadership roles as a student. She brings a strong background in

recruitment from a large and complex Toronto university and has worked with multiple audiences provincially and nationally.

We look forward to leveraging Jessica's detailed understanding of the GTHA educational landscape and an established educator network within that market to help support the institution's academic mission.

[4] UWindsor OUAC voucher initiative

Accessing higher education remains challenging for marginalized student populations, often caused by adverse childhood experiences, inequities and structural hurdles that start early and continue throughout life. Higher education cannot solve racism and societal injustice on its own. Still, we can take steps to be part of the solution, including making admissions and preparing students, initiatives, and policies that reduce equity gaps.

The University of Windsor has established a new undergraduate application voucher program that Ontario guidance counsellors and select community agencies/groups who work closely with marginalized communities (e.g., Hour A Day Study Club, Black Council of Windsor Essex, New Canadians' Centre of Excellence Inc), and Indigenous partners, with counsellors themselves identifying and sharing the vouchers with their students who are facing financial barriers and believe, would struggle financially to pay OUAC application fees.

The program officially launches at our upcoming Educator's day, bringing local high school teachers and counsellors to campus to learn more about the institution's academic programs and student support offerings.

[5] Plan your program

A vital tactic we employ to support our incoming undergraduate students is offering comprehensive resources to help first-year first-term (FYFT) course registration and guide new Lancers towards programming that assist in their transition to university.

Plan Your Program - Website:
This umbrella website provides new undergraduate students with all the information associated with the enrolment journey and to understand the first-term courses they should register for. It also becomes the core resource for central advising.

This initiative helps students understand the following:

- How to complete their course registration with confidence
- How to access help in person or live online, and
- How to access on-demand resources such as the updated registration guide, relevant KBAs on ask.uwindsor.ca and registration links
- Encourages them to sign up for winter orientation programs

Our student marketing and communications team are busy working with Faculties and academic program areas to review and confirm website content before making the site live for Winter 2023.

Respectfully submitted,
Chris

University of Windsor
Senate Governance Committee

5.2: **Report on Renewal, Tenure, and Promotion**

Item for: **Information**

Background:

At the June 2022 meeting, Senate passed the following motion.

MOTION: That the University Committee on Academic Promotion and Tenure (UCAPT) report to Senate in the Fall and Spring, through the Senate Governance Committee (SGC), an aggregated update on the Renewal, Tenure, and Promotion (RTP) process for the current academic year. Respecting the required confidentiality, the report shall include, as appropriate:

1. Information concerning: revisions to UCAPT and AAU (Academic Administrative Unit) RTP content (e.g., to reflect Equity, Diversity, Inclusion, and Decolonizing [EDID] initiatives); dates on mandatory training sessions for Deans, Heads and Directors including list of attendees, relevant supports (e.g., faculty RTP ombudsperson), a performance assessment of personnel critical to the RTP process (e.g. heads, directors, and deans); and any issues identified, together with a plan for redress;
2. UCAPT identified Equity, Diversity, Inclusion, and Decolonizing (EDID) data to control for equity and parity;
3. Gross number of faculty submitting applications at each stage in the RTP process, with final outcomes as currently available;
4. Processing times between identified critical action points at each stage of the RTP process;
5. Results from an anonymous “Faculty Evaluation of Process” (FEP) survey to be offered to all faculty that have undergone a UCAPT process during the academic year;
6. Any other such relevant items as prioritized by the President, UCAPT, Vice-President EDI, or the SGC.
7. Recommendations for Senate Bylaw revision identified as necessary

See attached for report.

Report on Renewal, Tenure, and Promotion

This report summarizes UCAPT related information for fall 2022 pertaining the motion of UCAPT reporting to Senate on aggregated RTP details for the fall semester 2022.

Candidate Related Data

Because UCAPT meetings begin after the first deadline for RTP related activities (e.g., contract renewal), no candidate related data is available as of this writing. The majority of RTP related activities occur practically between December and June.

For the 2022-2023 academic year, we expect to receive the following from all faculties:

- 21 contract renewals
- 23 tenure and promotion to associate professor
- 2 permanence and promotion to AAS III
- 5 promotions to full professor
- 1 promotion to AAS IV
- 1 promotion to Sessional Lecturer III

For the 2022-2023 academic year, we expect to receive the following from the Libraries:

- 1 contract renewal
- 1 permanence and promotion to Librarian III
- 1 permanence only consideration
- 1 promotion to Librarian IV

There may be additional candidates seeking full promotion, or from those choosing to seek tenure or admission before their probationary period concludes. These would not be known in advance and are initiated by the candidate.

Training and Information Sessions

A variety of information and outreach sessions were held during the fall of 2022 to provide information about the RTP process in general, as well as the "checkpoint process" introduced by this motion.

1. The RTP general information session is open to RTP committee members, UCAPT members, AAU Heads, candidates, and other members interested in more information about the RTP process. This was held on Thursday, September 29th with 34 individuals attending.
2. At the biweekly Deans Council meeting on Wednesday, October 19, an information session focused on the new RTP "checkpoint" process being implemented by this motion was presented to all Deans or their representatives.
3. Using the AAU Heads Group network, an information session focused on the new RTP "checkpoint" process being implemented by this motion for all AAU Heads was held on Tuesday, October 25th with 20 individuals attending.
4. On Tuesday, November 1st a session was held for all administrative assistants with 19 individuals attending.

At the general RTP information session, the main topics for discussion focused on:

- The specifics of applying the various rules and procedures for candidates applying to the RTP process.
- A discussion for preparing a teaching portfolio.
- Feedback from Dean Ken Montgomery about the RTP process.
- Discussion surrounding the upcoming RTP reporting checkpoint process introduced by this motion.

A conceptual workflow and reporting/tracking structure of key RTP related activities (including decisions) was developed and presented to the Deans; the AAU Heads Networking group; and the departmental administrative assistants for their feedback and commentary at the events noted above. Given the amount of work the RTP process

entails, one key objective is to minimize the additional amount of time and effort necessary for reporting on the RTP process in any AAU and corresponding faculty.

The feedback has been overall positive, and many acknowledge the value of a more detailed reporting mechanism. However, it was recognized that any process should be efficient and not cumbersome. As of this writing and based on the feedback received, the reporting process will be implemented using a combination of spreadsheet / shared drive access as a preliminary tracking mechanism for key RTP checkpoints. More information on how effective these checkpoints can be operationalized should be available next spring after it has been piloted through several RTP processes. There has also been some discussion into a future web-based approach for handling the RTP process for improved efficiency.

The feedback from both the Deans and AAU heads indicates further that the current due dates for applications to be submitted to UCAPT are unrealistic; for example, most RTP committees cannot be formed until late September when faculty and student representatives are available. Current bylaw deadlines would require a much earlier start, which is impractical given the circumstances. The current deadlines will be reviewed to determine if and which alternate dates would be more feasible.

Additional items contained in the motion will continue to be addressed as UCAPT meets to consider applications and discuss the motion details for 2022-2023.

University of Windsor
Senate Governance Committee

5.3: **Proposed Revisions to Bylaw 3**

Item for: **Approval**

Forwarded by: **SGC Bylaw Review Committee**

MOTION: That the proposed revisions Bylaw 3 be approved.

Proposed Revisions
[revisions are in track changes]

Bylaw 3
2.2.1 Senate Student Caucus

2.2.1.1 Membership (The total number of members is twenty-two):
[…]

- eleven students, one of whom shall be elected by the student members of the caucus to serve as co-chair for a maximum of two consecutive terms. The eleven students shall include the following:
  - two graduate students, two part-time undergraduate students, four full-time undergraduate students, one international student selected by the International Student Society, one residence student selected by the Windsor Inter-Residence Council, and one student selected by the Aboriginal Education Council. The student groups are encouraged to include representatives from multiple student constituencies, including registered student clubs, to reflect the diverse student populations.

Deleted: and from the Native Students' Alliance

Rationale:

- At the last October Senate meeting, members were informed that the Native Students' Alliance (a society ratified under the UWSA) is currently not operational and it is not clear when it may relaunch. In light of this, it was noted that a revision to Senate Student Caucus composition is needed to ensure Indigenous student participation in the Senate Student Caucus.

University of Windsor
Senate Governance Committee

5.4: **Strategic Items for Senate Discussion**

Item for: **Discussion**

Current list of Strategic Items for Senate discussion

December 2, 2022: Senate Information Session: Institutional and Research Data (data ethics)
January 6, 2023: Senate Information Session: Cybersecurity Framework
February 3, 2023: Senate Information Session: Micro-Credentials Update (new framework) ?
March 3, 2023: Senate Information Session: Accessibility for Ontarians with Disabilities Act (AODA) Compliance by 2025 ?

Additional suggestions? Suggestions for order/scheduling of the following items? ***Item for January SIS?***

1) Internationalization planning
2) SETs
3) University and College Partnerships
4) Work Integrated Learning
5) Curriculum Development
6) Individual Faculty plans and strategies moving forward
7) Entrepreneurship
8) Knowledge mobilization
9) Continuing Education
10) Future of Education (open discussion on differing approaches to teaching, learning, and evaluations; the purpose of education; and what student success means)
11) Accessibility Standards

Senate Information Sessions - 2:00-3:00pm

1. December 2, 2022
2. January 6, 2023
3. February 3, 2023
4. March 3, 2023
5. April 6, 2023
6. May 5, 2023
7. May 19, 2023

University of Windsor
Senate Governance Committee

5.5: **Review of Research Institute: Cross-Border Institute and Diagnostic Imaging Institute**

Item for: **Discussion/Approval**

Forwarded by: **Vice-President, Research and Innovation**

Background:

The *Senate Policy on the Establishment, Management and Renewal of University Research Centres and Institutes* states that Centres and Institutes are to be reviewed every five years. As part of this review, the Senate Governance Committee is tasked with making a determination as to whether a formal, independent Review Committee should be struck to conduct a full review of the Centre/Institute.

Excerpt from the Policy:

3.2 Review and Renewal of Centres and Institutes

All Centres/Institutes will be reviewed at least once during the five year period of existence. Notice of the review will be communicated to the Director of the Centre/Institute by the VPRI at least nine months prior to the end of the mandate of the Centre/Institute. As a Centre/Institute comes up for review, its Director will be asked to prepare a report. The report is to include a summary of the following:

(a) The list of faculty involved in the Centre/Institute's activities;
(b) The number of HQP involved in the Centre/Institute's activities (over the duration of the Centre/Institute and since the last review);
(c) A list of publications from the Centre/Institute's activities, innovation and other measures of activity, and;
(d) A list of research funding associated with the Centre/Institute.

The report will then be submitted to the VPRI, by a date established by the VPRI, for consideration and determination by the University Committee [the Senate Governance Committee] as to whether a formal, independent Review Committee should be struck to conduct a full review of the Centre/Institute. In the event that a more thorough examination is required, the following process will be observed. […]

Attached are the reports on the:
Cross-Border Institute
Diagnostic Imaging Institute

CROSS-BORDER INSTITUTE

Activities of the Cross-Border Institute (CBI)

Initial Report

October 15, 2015

Table of Contents

1 CBI Members

1.1 Key Academic Faculty Members

Name	Short Biography
Dr. Bill Anderson, Professor Director of CBI	Dr. Bill Anderson is a Full Professor of Political Science at the University of Windsor. He joined the University of Windsor in 2008 as Ontario Research Chair in Cross-Border Transportation Policy and founding director of the CBI. Before joining UWindsor, Dr. Anderson was a member of the Geography faculty, director of the Institute for Energy Studies and an associate member of the Department of Civil engineering at McMaster University From 1983 to 1998. From 1998 to 2008 he was a professor in the Department of Geography and a lead researcher in the Center for Transportation Studies at Boston University. Dr. Anderson's expertise is in border operations, technology and policy; freight transportation and supply chain; international trade and business; Canada-US economic integration; and regional economic development. At the CBI he leads a multidisciplinary team studying border traffic flows, the economic impact of border infrastructure, big data analysis of Global Positioning System data, cross-border customs and immigration and other topics with the common goal of making borders work better.
Dr. Hanna Maoh, Professor Associate Director of CBI	Dr. Hanna Maoh is a Full Professor of Civil Engineering where he teaches both undergraduate and graduate transportation engineering courses. He is also the Associate Director of the CBI and the founder of its Traffic Lab. Dr. Maoh is also the co-founder of the Transportation Systems Innovation (TSI) research Lab at the new Centre for Engineering Innovation at the University of Windsor. Dr. Maoh joined the University of Windsor in 2009 and since then he has been involved in numerous academic research projects to study various transportation problems from a holistic perspective by focusing on processes governing the movement of people and goods at various geographical scales. His main research interests include land use modeling, cross-border and freight transportation, network analysis, Big-Data analysis, travel demand analysis, passenger and commercial travel behavior, sustainable cities, development of geospatial planning support system and GIS applications. To date, he has published his research findings in numerous peer-reviewed international academic journals. Professor Maoh was the recipient of several awards from the University of Windsor for his excellence is research, scholarship and creative activities.

1.2 Key Non-Academic Members

Name	Short Biography
Ms. Marta Leardi-Anderson, Executive Director of CBI	Ms. Leardi-Anderson has over 20 years' experience providing strategic policy and operational advice to the most senior level decision makers in public and private sector organizations. She has led large scale projects and innovative initiatives. As a federal public servant in the Privy Council and in Transport Canada, she was responsible for cross-border and transportation files, including the Asia-Pacific Gateway and Corridor Initiative. At the CBI, she works on research and projects looking at the movement of goods, people, services and funds across international borders. She was on leave from her role as Executive Director of the CBI and served as the Executive Vice President for P3 Procurement and Policy at the Windsor Detroit Bridge Authority. Ms. Leardi-Anderson sits on the national board of directors for the Chartered Institute for Logistics and Transport, North America, was appointed the volunteer Chair of the Owen Sound Transportation Company by the Ontario Minister of Transportation (2020 to 2022) and was appointed a Global Fellow of the Wilson Center in Washington D.C.
Ms. Laurie Tannous, Special Border Customs and Immigration Advisor	Ms. Tannous is a cross-border attorney and a requested speaker at many trade and industry forums globally, providing public policy counsel to government officials and industry leaders on matters relating to cross-border management and security, immigration, customs, mobility, trade-in services, public-private partnerships (PPPs), and economic development initiatives. She presently holds several concurrent strategic positions including Special Advisor on Customs, Immigration, and Border Security to the University of Windsor's Cross Border Institute (CBI); Vice President, Government & Industry Relations, at Farrow Canada's largest independent customs broker; and with Tannous & Associates as a cross-border attorney specializing in immigration law, global anti-human trafficking, and cross-border PPPs.

1.3 Current Employees and Research Associates

Name	Position
Ms. Eva Wong	Secretary of the CBI
Dr. Georgiana Vani	Transportation Engineer
Mr. Terence Dimatulac	Transportation Engineer
Mr. Haibin Dong	Software Programmer

1.4 Key Past Employees

Name	Job Title	Duration
Ms. Patricia Simone	Business Development Research Coordinator	2014 – 2022
Ms. Lauren Stokes	Research Assistant	2017 – 2021
Dr. Shakil Khan	Transportation Engineer	2014 – 2021
Mr. Terence Dimatulac	GIS & Transportation Analyst	2018 – 2020
Mr. Sami Mazloum	Research Assistant	2015 – 2019
Ms. Renata Kobe	Research Assistant	2011 – 2018
Ms. Jennifer Winton	Research Assistant	2015 – 2017
Dr. Kevin Gingerich	GIS & Transportation Analyst	2014 – 2017
Ms. Maureen Campbell	Research Assistant	2013 – 2017
Ms. Monika Burdzy	Research Assistant	2013 – 2016
Dr. Sarah Dunphy	Policy and Research Coordinator	2012 – 2015

1.5 Past Postdoctoral Fellows

Name	Supervisor	Duration
Virgil Parker *	Dr. Bill Anderson	2021 – 2022
Dr. Mina Maleki	Dr. Hanna Maoh	2017 – 2018
Dr. Monir Moniruzzman	Dr. Hanna Maoh	2016
Dr. Tor Oiamo	Dr. Hanna Maoh	2015
Dr. Shu Segi	Dr. Bill Anderson	2014 – 2015

*US Fulbright Scholar

1.6 UWindsor Academic Affiliates

The CBI supports and coordinates diverse research by a cross-section of University of Windsor faculty and their students with the common goals of making borders work better and enhancing cross-border commerce, research and public services. The following is a list of the faculty members who are affiliated with the CBI and who have received support from it since its establishment:

Name	Faculty	Area of Research
Dr. Mohammed Baki	Business	Cross-border supply-chain
Dr. Xiaolei Guo	Business	Cross-border optimal tolls
Dr. Kevin Li	Business	Border waiting line system
Dr. Anthony Faria	Business	Border impact on location decision by auto parts manufacturers
Dr. Gurupdesh Pandher	Business	Decision tools for cross-border logistics and location choice
Mr. James Marsh	Business	Cross-border entrepreneurship and innovation
Dr. Sherif Saad Ahmed	Computer Science	Cross-border finance & blockchain technology
Dr. Ziad Kobti	Computer Science	Border mobile Apps
Dr. Boubakeur Boufama	Computer Science	Vehicle ID border surveillance
Dr. Imran Ahmad	Computer Science	Vehicle ID border surveillance
Dr. Arunita Jaekel	Computer Science	Sensor Systems
Dr. Xiaobu Yuan	Computer Science	Real-time flow prediction
Dr. Jianguo Lut	Computer Science	Traffic data network analysis

Dr. Nurlan Turdliev	Economics	Cross-border economics
Dr. Jay Rhee	Economics	Cross-border economics
Dr. Marcelo Arbex	Economics	Cross-border economics
Dr. Christian Trudeau	Economics	Cross-border economics
Dr. Sazzadur Chowdhury	Engineering	Small radar devices
Dr. Mitra Mirhassani	Engineering	Connected vehicles
Dr. Kemal Tepe	Engineering	Connected vehicles
Dr. Huapeng Wu	Engineering	Connected vehicles
Dr. Jonathan Wu	Engineering	Concealed weapon detection
Dr. Majid Ahmadi	Engineering	Real-time location for large indoor environments
Dr. Walid Abdul-Kader	Engineering	Truck queuing at border inspection plazas
Dr. Mehrdad Saif	Engineering	Wireless surveillance
Dr. Shi Kui Wu	Engineering	Cross-border e-retailing
Dr. Yuanyuan Wu	Engineering	Cross-border e-retailing
Dr. Guoqing Zhang	Engineering	RFID/Supply chain technologies
Dr. Chris Lee	Engineering	Cross-border Traffic Sensors
Dr. Yong Hoon Kim	Engineering	Cross-border Traffic Sensors
Dr. Mike McKay	GLIER	Great Lakes Institute for Environmental Research
Dr. Lisa Porter	Science	Health Institute, UWindsor
Dr. Roman Maev	Science	Biometric screening technology

1.7 Non-Academic & External Affiliates

CBI is widely diverse in its activities within and outside the university. The following non-academic affiliates have worked CB with over the past 8 years:

Name	Organization	Area of Research/Specialisation
Bob Armstrong	Armstrong Trade and Logistics Advisory Services Inc. (ATLAS)	Trade, Supply Chain and Logistics
Christopher Sands	Wilson Centre's Canada Institute	Specialist on Canada and US-Canadian relations
Daniel Lynch	Michigan State Policy Center	Supply Chain Management/ Marketing & Global Trade
Gutavo de la Fuente	Smart Border Coalition	US- Mexico Border
John Tofflemire	RC Spencer Inc.	Traffic and Transportation Engineering
Kathryn Friedman	Ted Stevens Center for Artic Security Studies	Policy Advisor
Marek Litwin	ITS POLSKA Association	Intelligent Transportation Systems
Mark Ferguson	McMaster Institute for Transportation and Logistics	Transportation and Freight Modeling
Mark High	Canada- U.S. Business Association	Movement of people and goods across the Canada-US borders
Roger Hamlin	Michigan State Policy Center	Urban planning and public policy
Tiffany Melvin	NASCO	North American Trade

2 Highly Qualified Personnel (HQP)

The CBI has been actively engaged in Training HQPs at the undergraduate and graduate levels. These HQPs (PhDs, Masters and undergraduates) were supervised by the Key Faculty at CBI and worked directly at the Traffic Research Lab of CBI.

PhD Students:

Name	Thesis Title	Completion Date
Supervisor: Dr. Bill Anderson		
Chris Aspila	Modelling Cross-Border Rail Intermodality in the Windsor-Essex Context	2021
Supervisor: Dr. Hanna Maoh		
Terence Dimatulac	Modeling the Potential Impacts of Electrifying Long-Haul Trucks in Ontario, Canada	Ongoing
Georgiana Madar	Modeling the Resiliency of Freight Transportation Networks in Ontario, Canada	2021
Shakil Khan	Modeling the Adoption of Electric Vehicle Fleets by Canadian Corporations and Governmental Agencies	2020
Kevin Gingerich	Modeling Commercial Vehicle Movements Using Truck GPS Big-Data	2017

Masters Students:

Name	Thesis Title	Completion Date
Supervisor: Dr. Bill Anderson		
James Dunn	Project Risk Management in Public-Private Partnerships: An Equitable Risk Allocation Decision Model based on Psychometrics	2017
Aline Bedouin	Biometrics: Privacy Enhancement Mechanisms	2016
Charlene Keizer	Open the floodgates, close the borders: A review of immigration policy harmonization between Canada and the US	2016
Maureen Campbell	The Auto Pact and the 'New' Trade Theory: Applying Economic Geography to International Trade Agreements	2014
Supervisor: Dr. Hanna Maoh		
Mohamed Abdo	Calibration and Validation of the Land Use Module of the SMARTPLANS Integrated Urban Model for Calgary, Alberta	2021

Ayat Hussein	Modeling Optimal Freight Logistics Facility Locations Based on the Clustering of Industries and Truck Trip Patterns in Ontario	2020
Ahmed Alshurafa	Modelling Truck Stop Destinations and Durations Within a Truck Tour Micro-Simulation Framework for the GTHA, Ontario, Canada	2020
Sidra Anis	Microsimulating Cross-Border Truck Movements between Ontario and the United States: An Application using Connected Vehicle Technology	2019
Amal Ghamrawi	Modeling the feasibility and benefits of adopting CNG fueling technology by heavy trucks: An Application to Greater Toronto Area (GTA)	2017
Rahaf Husein	Travel Demand Modeling for London, Ontario, Canada	2017
Laura Ash	Excess Commuting and Its Relation to Urban Form in Ontario, Canada	2017
Terence Dimatulac	Modeling the Adoption of Electric Vehicle Fleets by Canadian Car Rental Companies	2016
Aya Hagag	Commercial Vehicle Ownership Modeling: A Case Study to Windsor Ontario	2016
Georgiana Madar	Studying urban commercial vehicle movement activities in Windsor, Ontario	2014

The CBI also supported a number of Masters students from the department of Computer Science by housing them at the Traffic Research Lab and providing them access to CBI proprietary traffic data to conduct their Masters research. Here is a list of the supported students from Computer Science:

Name	**Thesis Title**	**Completion Date**
Shiv Sondhi	Empirical Performance Evaluation of Consensus Algorithms In Permissioned Blockchain Platforms	2021
Vijay Rajasekar Thirulokachander	Impact of Design Patterns on Code Quality in Blockchain-based Applications	2020
Sindhuja Gutha	A deep learning approach to real-time short-term traffic speed prediction with spatial-temporal features	2019
Vidhi Patel	Big Data Mining to Construct Truck Tours	2018

Undergraduate Students

The Traffic Research Lab of CBI housed over 20 undergraduate research assistants since 2015. These students worked with Dr. Maoh and his research group on various transportation research projects.

The CBI also supported 25 undergraduate students from computer science through a ScotiaBank Grant. Further, the CBI supported the training of 16 HQPs from the University of Windsor through a FedDev. In fact, the FedDev grant that was administered by the CBI funded a total of 171 positions as follows:

- 12 Permanent Full-time positions
- 7 permanent Part-time positions
- 33 seasonal/Contract Full-time
- 119 Seasonal/contract part-time

3 Publications

3.1 Academic Peer Reviewed Papers

Georgiana Madar-Vani, Hanna Maoh. (2022). A Framework for Prioritizing Infrastructure Improvements Based on Link Criticality and Economic Benefit: An Application to the Province of Ontario, Canada. Submitted to Case Studies in Transport Policy.

Sarah Cipkar, Hanna Maoh, Terence Dimatulac, Frazier Fathers, Shereen Arcis, Anneke Smit. (2022). ADUs and the Low-density, Suburban Neighbourhood: Potential and Possibilities. Submitted to The Canadian Geographer.

Sahand Ashtab, William P. Anderson (2022). Differences in Manufacturing and Healthcare Supply Chain Management: and Overview, International Journal of Healthcare Technology and Management, accepted for publication March 7, 2022.

Georgiana Vani, Hanna Maoh. (2022). Characterizing the Nature of a Multi-Regional Trucking Network Using the Network Robustness Index: An Application to Ontario, Canada. Applied Spatial Analysis and Policy. https://doi.org/10.1007/s12061-022-09484-w

Vidhi Patel, Jessica Chen, Mina Maleki, Mehdi Kargar, Hanna Maoh. (2022). A cluster-driven classification approach to truck stop location identification using passive GPS data. Journal of Geographical Systems. https://doi.org/10.1007/s10109-022-00380-y

Shakil Khan, Hanna Maoh. (2022). Investigating Attitudes Towards Fleet Electrification - An Exploratory Analysis Approach. Transportation Research Part A. 162: 188-205.

Hanna Maoh, William Anderson. (2021). The Impact of COVID-19 on the Movement of Trucks Between Canada and the US: Evidence from the Ambassador Bridge. Transport Findings. https://doi.org/10.32866/001c.24958

Shakil Khan, Hanna Maoh. (2021). The Demand for Electrification in Canadian Fleets: A Latent Class Modeling Approach. Transportation Research Part D. 90: 102653.

Hanna Maoh, Terence Dimatulac, Shakil Khan, Marek Litwin. (2021). Studying Border Crossing Choice Behavior of Trucks Moving between Ontario, Canada and the United States. Journal of Transport Geography. 91: 102992.

Shakil Khan, Hanna Maoh. (2021). Battery Electric Vehicle Acquisition Timeframes in Canadian Fleets. Transportation Planning and Technology. 44(8): 807-826.

Georgiana Madar, Hanna Maoh, Kevin Gingerich. (2021). Modeling Commercial Vehicle Trip Generation at the Business-Establishment Level. Canadian Journal of Civil Engineering. 48: 669-680.

Georgiana Madar-Vani, Hanna Maoh, William Anderson. (2021). Modeling the Criticality of a Regional Trucking Network at the Industry Level: Evidence from the Province of Ontario, Canada. Research in Transportation Business & Management. 43, 100732.

Georgiana Madar, Hanna Maoh, William Anderson. (2020). Examining the Robustness of the Ontario Truck Road Network. Journal of Geographical Systems. 22: 309-333.

Jamie Spinney, Hanna Maoh, Hugh Millward. (2019). Factors affecting mode choice for the home-elementary school journey: Evidence from Halifax, Canada. The Canadian Geographer. 63(2): 254-266.

Mark Ferguson, Moataz Mohamed, Hanna Maoh. (2019). On the Electrification of Canada's Vehicular Fleets. IEEE Electrification Magazine. 7(3): 55-65.

Kevin Gingerich, Hanna Maoh. (2019). The role of airport proximity on warehouse location and associated truck trips: Evidence from Toronto, Ontario. Journal of Transport Geography. 74: 97-109.

William Anderson, Hanna Maoh, Kevin Gingerich. (2019). Cross-border freight movements in the Great Lakes and St. Lawrence Region, with insights from passive GPS data. The Canadian Geographer. 63(1): 69-83.

Terence Dimatulac, Hanna Maoh, Shakil Khan. (2019). Modeling the Purpose for Renting Passenger Vehicles. Transport Findings. https://doi.org/10.32866/10937

Terence Dimatulac, Hanna Maoh, Shakil Khan, Mark Ferguson. (2018). Modeling the demand for electric mobility in the Canadian rental vehicle market. Transportation Research Part D. 65: 138-150.

Hanna Maoh, Kevin Gingerich, Rahaf Husein, William Anderson. (2018). Examining the Variability of Crossing Times for Canadian Trucks at the Three Major Canada-U.S. Border Crossings. The Professional Geographer. 70(3): 350-362.

Terence Dimatulac, Hanna Maoh. (2017). Modelling the Spatial Distribution of Hybrid-Electric Vehicles In Windsor, Ontario. Journal of Transport Geography. 60: 59-67.

Zahra Ashrafi, Hamed Shahraki, Chris Bachmann, Kevin Gingerich, Hanna Maoh. (2017). Quantifying the Criticality of Highway Infrastructure for Freight Transportation. Transportation Research Record: Journal of Transportation Research Board. 2610: 10-18.

Umair Durrani, Chris Lee, Hanna Maoh. (2016). Calibrating the Wiedemann's vehicle-following model using mixed vehicle-pair interactions. Transportation Research Part C: Emerging Technologies. 67: 227-242.

Monir Moniruzzaman, Hanna Maoh, William Anderson. (2016). Short-term prediction of border crossing time and traffic volume for commercial trucks: A case study for the Ambassador Bridge. Transportation Research Part C: Emerging Technologies. 63: 182-194.

Kevin Gingerich, Hanna Maoh, William Anderson. (2016). Classifying the purpose of stopped truck events: An application of entropy to GPS data. Transportation Research Part C: Emerging Technologies. 64: 17-27.

Shakil Khan, Hanna Maoh, Chris Lee, William Anderson. (2016). Towards sustainable urban mobility: investigating nonwork travel behavior in a sprawled Canadian city. International Journal of Sustainable Transportation. 10 (4): 321-331.

Hanna Maoh, Shakil Khan, William Anderson. (2016). Truck movement across the Canada-US border: the effects of 9/11 and other factors. Journal of Transport Geography. 53: 12-21.

Kevin Gingerich, Hanna Maoh, William Anderson. (2016). Characterization of international origin–destination truck movements across two major U.S.–Canadian border crossings. Transportation Research Record: Journal of Transportation Research Board. 2547: 1-10.

Mark Brown, William P. Anderson. (2015). How Thick is the Border: the relative cost of Canadian domestic and cross-border truck-borne trade, 2004-2009. The Journal of Transport Geography, 42:10-21.

Maureen Campbell, Matthew Cooper, Kathryn Friedman and William P. Anderson. (2015). The Economy as a Driver of Change in the Great Lakes – St. Lawrence River Basin. Journal of Great Lakes Research, 41(1):69-83.

Kevin Gingerich, Hanna Maoh, William Anderson. (2015). Border Crossing Choice Behavior of Trucks Along Trade Corridor Between Toronto, Ontario, Canada and Chicago, Illinois, Transportation Research Record: Journal of the Transportation Research Board, 2477, 85-92.

3.2 Book Chapters

Hanna Maoh, Khandker Nurul Habib (2023). Integrated Land Use and Transport Models, in Handbook of Travel Behaviour, Chapter 9, Edward Elgar, 2022, Editor(s) – Dimitris Potoglou, Justin Spinney. (Forthcoming).

Rahaf Husein, Hanna Maoh, Dimitris Potoglou (2018). Factors influencing journey-to-work by public transit, in mega Canadian cities, The Practice of Spatial Analysis, 167-186, Chapter 7, Springer, 2018, Editor(s) - Eleni Briassouli, Nikos Soulakellis, Dimitris Kavroudakis.

Dimitris Potoglou, Hanna Maoh, Yiming Wang, Scott Orford (2018). The impact of public transport infrastructure on land values - Using spatial data analysis to uncover policy-relevant processes, in The Practice of Spatial Analysis, 275-293, Chapter 12, Springer, 2018, Editor(s) - Eleni Briassouli, Nikos Soulakellis, Dimitris Kavroudakis.

William P. Anderson, Hanna Maoh and Charles Burke (2018). Regional Economic Impacts of a Transportation Infrastructure Project: The Herb Gray Parkway, in Transportation, Knowledge and Space in Urban and Regional Economies, 24-46, Chapter 3, Edward Elgar, 2018, Editor(s) - Kakuya Matsushima and William P. Anderson.

William P. Anderson, (2017). NAFTA and ASEAN: The Perils and Promise of Cross-Border Supply Chains, in The ASEAN Economic Community: A Project in Cross-Border Integration, Kiyoshi Kobayashi, Chapter 5, Routledge (Taylor and Francis Group), Editor(s) - Khairuddin Abdul Rassid, Masahiko Furuichi, and William P. Anderson.

3.3 Technical Reports

Hanna Maoh, Terence Dimatulac. (2022). Integrated Urban Modeling: Scenario Simulation with SMARTPLANS for Five Canadian Cities, Final Report Prepared for Health Canada, 2022, Technical Report, March, March 2022 - 176 pages

Bill Anderson, Laurie Tannous, Roger Hamlin, Dan Lynch and Bob Armstrong, (2021). The Gordie Howe International Bridge and the Binational Great Lakes Economic Region: Assessing Economic Impacts and Realizing Economic Opportunities, for the Windsor-Detroit Bridge. Full Report at The Gordie Howe International Bridge and the Bi-National Great Lakes Economic Region: Assessing Economic Impacts and Realizing Economic Opportunities (cbinstitute.ca).

Terence Dimatulac, Hanna Maoh. (2021). Integrated Urban Modeling: Scenario Simulation with SMARTPLANS for Calgary, Alberta, Report Prepared for Health Canada, 2021, Technical Report, March, March 2021 - 92 pages.

Bill Anderson, Marta Leardi-Anderson and Laurie Tannous, (2020). A Practical Approach to Easing Restrictions at the Canada-US Border in the Covid-19 Pandemic, CBI Policy Note, available at Easing-Border-Restrictions-at-the-Canada-US-Border.pdf (cbinstitute.ca)

Bill Anderson, (2020). Freight Innovation in Canada: adoption of disruptive technologies by the freight transportation sector, for Transport Canada, available at CBI-Overview-Cybersecurity.pdf (cbinstitute.ca).

Terence Dimatulac, Hanan Maoh. (2020). Integrated Urban Modeling: Calibration of SMARTPLANS for Calgary, Alberta, Report Prepared for Health Canada, 2020, Technical Report, September, September 2020 - 53 pages.

Hanna Maoh, Terence Dimatulac, (2020). Integrated Urban Modeling: Scenario Simulation with SMARTPLANS for Ottawa, Ontario, Report Prepared for Health Canada, 2020, Technical Report, July, July 2020 - 64 pages.

Hanna Maoh, Terence Dimatulac, (2020) Integrated Urban Modeling: Calibration of SMARTPLANS for Ottawa, Ontario, Report Prepared for Health Canada, 2020, Technical Report, March, March 2020 - 57 pages.

Bill Anderson, (2019). Cybersecurity, Cross-Border Trade and the Digital Economy: Enabling Smart, Secure Systems, CBI, available at https://www.cbinstitute.ca/wp-content/uploads/2020/01/CBI-Overview-Cybersecurity.pdf

Hanna Maoh, Terence Dimatulac, Shakil Khan, (2019). Integrated Urban Modeling: Scenario Simulation with SMARTPLANS for Vancouver, British Columbia, Report Prepared for Health Canada, 2019, Technical Report, July, July 2019 - 51 pages.

Hanna Maoh, Terence Dimatulac, Shakil Khan, (2019). Integrated Urban Modeling: Calibration of SMARTPLANS for Vancouver, British Columbia, Report Prepared for Health Canada, 2019, Technical Report, March, March 2019 - 38 pages.

William Anderson, Shu Segi, Hanna Maoh, Maureen Campbell, John Anderson, Georgiana Madar, (2019). Comprehensive Assessment of Economic Benefits Due to the Gordie Howe International Bridge, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), Report, January, January 2019 - 43 pages.

William Anderson, Shakil Khan, Hanna Maoh, Laurie Tannous, Bob Armstrong, Roger Hamlin, Daniel Lynch, (2019). Final Report on Public Consultation Due to the Gordie Howe International Bridge, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), Final Report, January, January 2019 - 18 pages.

Bill Anderson, Marta Leardi-Anderson and Laurie Tannous. 2018, Automated Trucking and Border Crossings, for Transport Canada, available at https://www.cbinstitute.ca/reports-working-papers/

Hanna Maoh, Terence Dimatulac, Shakil Khan, Tor Oiamo, Mina Maleki, (2018). Integrated Urban Modeling: Scenario Simulation with SMARTPLANS for Halifax, Nova Scotia and

London, Ontario, Report Prepared for Health Canada, 2018, Technical Report, October, October 2018 - 90 pages.

Hanna Maoh, Terence Dimatulac, (2018). Traffic Impact Planning Model: Technical Report on Border Choice Modeling, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), 2018, Technical Report, July, July 2018 - 17 pages.

Shakil Khan, Sidra Anis, Hanna Maoh, (2018). Traffic Impact Planning Model: Technical Report on Microsimulation Models for Areas of Interest, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), 2018, Technical Report, July, July 2018 – 59 pages.

Hanna Maoh, Terence Dimatulac, Shakil Khan, (2018). Traffic Impact Planning Model: Technical Report on Travel Demand Modeling, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), 2018, Technical Report, July, July 2018 - 96 pages.

Hanna Maoh, Tor Oiamo, Terence Dimatulac, Shakil Khan, (2018). Integrated Urban Modeling: Calibration of SMARTPLANS for Halifax, Nova Scotia and London, Ontario, Report Prepared for Health Canada, 2018, Technical Report, March, July 2018 - 106 pages.

William Anderson, Hanna Maoh, Terence Dimatulac, (2017). Accessibility Improvements Due to the Gordie Howe International Bridge, Report Prepared for Windsor-Detroit Bridge Authority (WDBA), 2017, Technical Report, July, July 2017 - 35 pages.

William Anderson, Hanna Maoh, Shakil Khan, Kevin Gingerich, Maureen Campbell, Roger Hamlin, Daniel Lynch, (2017). Preliminary Analysis on Data Resources for Assessing Economic Impacts of the Gordie Howe International Bridge, Report Prepared for Windsor- Detroit Bridge Authority (WDBA), 2017, Technical Report, April, April 2017 - 54 pages.

Shakil Khan, Hanna Maoh, William Anderson, (2016). Primary Inspection Kiosk (PIK): Micro-Simulations for the Calgary International Airport (YYC), Report Prepared for Canadian Border Services Agency (CBSA), 2016, Technical Report, January, January 2016 - 41 pages.

Kevin Gingerich, Hanna Maoh, William Anderson, (2015). Classifying Trips by Origin, Destination, Industry, and Border Crossing, Report Prepared for Transport Canada, 2015, Final Report, March 2015 – 43 pages.

3.4 Academic Conferences

Terence Dimatulac, Hanna Maoh, Rupp Carriveau. (2022). An Archetypal Network Model for Identifying Potential Charging Locations for Long Haul Electric Vehicles in Ontario, Canada. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Montreal, Canada (255-263). Conference Date: 2022/6

Georgiana Madar, Hanna Maoh, William Anderson. (2021). A Methodology for Obtaining Industry-Level Freight Flows Using Existing Data Sources for The Exploration of Trade

Criticality Within the Province of Ontario, Canada. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Virtual Conference. Conference Date: 2021/5

Hanna Maoh, William Anderson. (2021). Exploring the Impact of COVID-19 on the Movement of Trucks Between Canada and the US: The Case of the Ambassador Bridge. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Virtual Conference. Conference Date: 2021/5

Terence Dimatulac, Hanna Maoh. (2021). Extending the SMARTPLANS Integrated Urban Model to Estimate Pollution Concentration from Vehicles: An Application to Ottawa, Canada. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Virtual Conference. Conference Date: 2021/5

Mohamed Abdo, Hanna Maoh. (2021). Modeling and Validating the Price of Residential Housing in the SMARTPLANS Integrated Urban Model. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Virtual Conference. Conference Date: 2021/5

Sindhuja Gutha, Mina Maleki, Hanna Maoh. (2021). Real-Time Traffic Speed Prediction in Abnormal Conditions Using Machine and Deep Learning Methods. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Canadian Transportation Research Forum (CTRF), Virtual Conference. Conference Date: 2021/5

Georgiana Madar and Hanna Maoh. (2020). Evaluating the inter-dependence between network robustness and trade criticality with an application to the Province of Ontario, Canada. Conference Proceedings Book. Annual Meeting of Canadian Transportation Research Forum (CTRF). Conference Date: 2020/6

Tor Oiamo; Lauren White; Hanna Maoh; Markey Johnson. (2019). Developing a Sustainability Indicator Weighting Scheme for Integrated Urban Modelling and Health Outcomes in SMARTPLANS. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (258-264). Conference Date: 2019/5

Georgiana Madar; Hanna Maoh. (2019). Assessing the Representativeness of Survey Respondents for Micro-Level Network Resilience Modeling. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (393-400). Conference Date: 2019/5

Terence Dimatulac; Hanna Maoh; Tor Oiamo; Markey Johnson. (2019). Simulating the Future Impacts of Urban Transit System Improvements: Application to London, Ontario and Halifax,

Nova Scotia. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (241-248). Conference Date: 2019/5

Sidra Anis; Hanna Maoh. (2019). Modelling Truck Movement across the Canada-US Border: A VISSIM Dynamic Traffic Assignment Application. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (182-190). Conference Date: 2019/5

Hanna Maoh; Terence Dimatulac; Tor Oiamo; Markey Johnson; Dave Stieb. (2019). Extending the SMARTPLANS Integrated Urban Modeling Framework to Evaluate the Impacts of Air Quality on Health Outcomes. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (265-272). Conference Date: 2019/5

Ayat Hussein; Hanna Maoh. (2019). Big Data Analysis to Explore the Clustering of Truck Trips Patterns Across Canada. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (109-116). Conference Date: 2019/5

Hanna Maoh; Terence Dimatulac; Tor Oiamo; Markey Johnson. (2019). Implementation of the SMARTPLANS Integrated Urban Model for Halifax, Nova Scotia and London, Ontario. Conference Proceedings Book. Canadian Transportation Research Forum (CTRF), Vancouver, Canada (249-257). Conference Date: 2019/5

Terence Dimatulac, Hanna Maoh, Shakil Khan. (2018). Why Do People Rent Passenger Vehicles: Evidence From Canada. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Gatineau, Canada (227-230). Conference Date: 2018/6

Georgiana Madar, Hanna Maoh, William Anderson. (2018). Assessing the potential impacts of unexpected closure of a major crossing between Canada and US. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Gatineau, Canada (77-81). Conference Date: 2018/6

Shakil Khan, Sarah Khalid, Hanna Maoh, Kemal Tepe. (2018). Making Informed Route Choices Using V2V/V2I Communications: The Case of Highway 401/402 Corridor. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF). Conference, Gatineau, Canada (63-68) Conference Date: 2018/6

Kevin Gingerich, Hanna Maoh. (2017). Big Data Analysis to Measure Delays of Canadian Domestic and Cross- Border Truck Trips. Proceedings DVD. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington DC, United States. Conference Date: 2017/1

Hanna Maoh, Shakil Khan, William Anderson. (2017). Cross-Border Impediments Facing Canadian Shippers Trading with US Markets: Insights from a Recent Survey. Proceedings DVD. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington DC, United States. Conference Date: 2017/1

Hanna Maoh, Rahaf Husien, Kevin Gingerich, William Anderson. (2017). Modeling Crossing Times of Canadian Trucks at the Three Major Canada-U.S Border Crossings. Proceedings DVD. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington DC, United States. Conference Date: 2017/1

Terence Dimatulac, Hanna Maoh. (2016). Modeling the Demand for Renting Electric Vehicles in Canada: A Stated Preference Approach. EVS29, Electric Vehicle Symposium & Exhibition, Montreal, Canada. Conference Date: 2016/6

Rahaf Husein, Hanna Maoh. (2016). Journey-to-Work by Public Transit: Recent Evidence from the Four Largest Urban Centers in Canada. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Toronto, Canada. Conference Date: 2016/6

Shakil Khan, Hanna Maoh. (2016). Fleet Managers Survey: Electric Fleet Acquisition by Commercial Sectors in Canada. EVS29, Electric Vehicle Symposium & Exhibition, Montreal, Canada. Conference Date: 2016/6

Aya Hagag, Hanna Maoh. (2016). Microsimulating the Spatial Distribution of Commercial Vehicles by the Location of Their Owned Establishments. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Canada. Conference Date: 2016/5

Kevin Gingerich, Hanna Maoh. (2016). Expansion of a GPS truck trip sample to remove bias and obtain representative flows for Ontario. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Toronto, Canada. Conference Date: 2016/5

Terence Dimatulac, Hanna Maoh. (2016). Simulating Transportation and Environmental Outcomes of Electric Vehicle Adoption Scenarios. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Toronto, Canada. Conference Date: 2016/5

Hanna Maoh, Kevin Gingerich. (2016). Simulation Model for Assessing the Ramifications of Transportation Plans and Land use Scenarios. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Toronto, Canada. Conference Date: 2016/5

Shakil Khan, Hanna Maoh, William Anderson. (2016). Simulating the Impacts of RFID Enabled Lanes for Commercial Vehicles at the Ambassador Bridge Plaza. Conference Proceedings Book. Annual Meeting of the Canadian Transportation Research Forum (CTRF) Conference, Toronto, Canada. Conference Date: 2016/5

Monir Monirruzaman, Hanna Maoh, William Anderson. (2016). Freight Mode Choice Model for Cross-border Shipment of Commodities between Canada and the US: A mixed logit approach. 2016 American Association of Geographers (AAG) Conference, San Francisco, United States Conference Date: 2016/4

Terence Dimatulac, Hanna Maoh, Shakil Khan. (2016). Survey and Analysis of the Canadian Rental Vehicle Market. Conference for Big Ideas Big Cities: the critical role for Electric Vehicles, Hamilton, Canada. Conference Date: 2016/4

Monir Monirruzaman, Hanna Maoh, William Anderson. (2016). Short-term Prediction of Border Crossing Time and Traffic Volume: A Case Study for the Ambassador Bridge. DVD Proceedings. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington, DC., United States. Conference Date: 2016/1

Terence Dimatulac, Hanna Maoh. (2016). Modeling Spatial Distribution of Hybrid-Electric Vehicles in Windsor, Ontario. DVD Proceedings. Annual Meeting of Transportation Research Board (TRB) Conference, Washington, DC., United States. Conference Date: 2016/1

Hanna Maoh, Shakil Khan, Georgiana Madar. (2016). Urban Commercial Vehicle Movement Data Collection: Reducing Survey Cost and Improving Response Rate. DVD Proceedings. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington, DC., United States. Conference Date: 2016/1

Kevin Gingerich, Hanna Maoh, William Anderson. (2016). Characterization of international origin-destination truck movements across major Ontario-Michigan border crossings. Transportation Research Record: Journal of Transportation Research Board. Annual Meeting of the Transportation Research Board (TRB) Conference, Washington, DC., United States (1-10). Conference Date: 2016/1

3.5 Discussion Panels, Media Interviews and Public Outreach

Media and Op-Ed

Hanna Maoh and Terence Dimatulac, Electrifying Freight Transport, Episode #48, 360 Energy, The 360 on Energy and Carbon Podcast, (https://open.spotify.com/episode/3hBBKUCfB1oykgH0ieHFYe), June 1, 2022.

Media and Op-Ed William Anderson and Marta Leardi-Anderson, Keep on Trucking: Trucks Must Keep Moving Across the Canada-US Border Amid Coronavirus, The Conversation, March 22, 2020.

Bill Anderson, Marta Leardi-Anderson and Laurie Tannous, Cross-Border Personal Mobility in the COVID-19 Crisis, FutureEconomy.ca, May 26, 2020

Invited Speaking Engagements (delivered by William Anderson)

The Border and the Ontario Economy, Graduate School of Management, Kyoto University, Japan, February 26, 2015.

NAFTA and ASEAN: The Promise and Perils of Cross-Border Supply Chains, Second International Conference on ASEAN Economic Integration, Kuala Lumpur, Malaysia, March 2, 2015 (keynote address).

Canada-US Border's Impact on Manufacturing Supply Chains, Research Seminar in Transportation Economics and Policy, Transport Canada, June 8, 2015

The Border and the Auto Industry in the Great Lakes Region, Automotive Community Partnership, October 7, 2015.

Analyzing Border Truck Movements Using GPS Data, (with Prof. Hanna Maoh), Borders in Globalization Round Table, November 16, 2015.

Research at the Cross-Border Institute, University of Windsor, Division Day, Ontario Ministry of Research and Innovation, Commercialization and Entrepreneurship Division, Toronto, December 9, 2015.

The Border and the Ontario Economy, University of Ottawa Certificate Program in Public Sector Leadership and Governance, February 5, 2016.

Five Points About Ontario's Cross-Border Economy, Ontario Ministry of Economic Development, Employment and Infrastructure, Business Advisory Service, April 14, 2016.

Uncertainty and Cross-Border Supply Chains, Eastern Border Transportation Coalition, April 19, 2016.

The Gordie Howe International Bridge and Economic Opportunities in Windsor-Essex, Michigan State University Institute for Public Policy and Social Research Forum, Lansing, April 20, 2016.

The Border, Economic Integration and Binational Advantage in the Great Lakes Region, Council of State Governments, Midwest-Canada State and Provincial Leaders Meeting, Queens Park, May 6, 2016.

Cross-Border Trade, Choose Canada event, Windsor-Essex Economic Development Corporation (WEEDC), Windsor, May 14, 2016.

Research at the Cross-Border Institute, University of Windsor, Canada Border Services Agency, Comptrollership Branch, Ottawa, May 30, 2016.

A Framework for Security in Commercial Border Operations, Canada Border Services Agency, August 15, 2016.

The Gordie Howe International Bridge: What's Happening? Why it Matters? What to Expect? University of Windsor, Alumni Weekend, October 2016.

Economic Development in Border Regions: Theory, Evidence and Policy, Asian Institute of Public Policy and Development Studies, Kolkata, India, November 15, 2016.

Detroit, An International City: Detroit-Windsor Crossing as the Nexus of the Binational Great Lakes Region. Detroit Revitalization Fellows, Belle Isle, Detroit, March 31, 2017.

The Cross-Border Institute at the University of Windsor, Institute for Border Logistics and Security, Windsor, May 11, 2017.

The Border and the Binational Advantage, Canada-US Parliamentary Group, Caesar's Windsor, September 15, 2017.

Research at the Cross-Border Institute, Eastern Border Transportation Coalition, Montreal, September 20, 2017.

University of Windsor and the State School of Higher Education in Chelm, Polish-Canadian Dinner, Windsor, November 24, 2017.

Cross-Border Supply Chains as Mechanisms for Canada-US Economic Integration: History and Prospect, Borders in Globalization, Second International Conference, Ottawa, December 7, 2017.

Research at the Cross-Border Institute, University of Windsor, Visit from the Ontario Minister of Transportation and Staff, December 14, 2017.

Future of Commercial Border Crossings, Leveraging Emerging Logistics Technologies, Chartered Institute of Logistics and Transportation North America (CILTNA), May 14, 2018.

Challenges and Opportunities at Canada's Border Crossings, US Department of Homeland Security University Centers of Excellence Summit, Arlington, VA, May 30, 2018.

Smart Corridors – Smart Borders – Smart Cities, (keynote luncheon address), ITS Canada Annual Conference, Niagara Falls, ON, June 2018.

Trade Developments and Transportation: USMCA and Section 232, Transportation Update with CILTNA, Transport Canada, October 29, 2018.

Prospects for Cross-Border Supply Chains: Technology, Infrastructure and Diplomacy, WEEDC Emerging Technologies in Automation conference, Caesar's Windsor, November 6, 2018.

Canada-European Union Comprehensive Economic and Trade Agreement (with Laurie Tannous), seminar presented by the Cross-Border Institute, Warsaw Poland, June 3, 2019.

The Windsor Detroit Crossing: the Nexus for North American Supply Chain Integration (with Marta Leardi-Anderson), PWSZ Chelm, June 7 and Transport in the 21st Century, International Science Conference, Ryn, Poland, June 9, 2019.

The Cross-Border Institute at the University of Windsor, George W. Bush Presidential Center, Dallas, TX, February 7, 2019.

The Binational Advantage: What does it mean to be a cross-border region in a globalized world, Canada-US Cross-Border Innovation Corridors: a Dialogue, Niagara-on-the-Lake, May 16, 2019 (keynote address.)

The US-Canada Border: Strategies and Policies to Speed Up Movement of People and Goods: Midwest-Canada Relations Committee, Midwest Legislative Conference, Chicago, July 21, 2019.

Border Delays: toward comprehensive assessment of economic impacts and policy options, Canada Border Service Agency Headquarters, Ottawa, January 17, 2020.

The Canada-US Border, Trucking, and the Pandemic, CILTNA Fall Transport Outlook Conference, November 9, 2020.

The Current State of Transportation and Logistics in Canada, with implications for international / global supply chains, and Movement of People and Goods, the Principal Modes – Trucking, Transport Canada, January 15,2020 (part of a staff training event in association with CILTNA.)

The Gordie Howe International Bridge: Implications for Ohio, Miami County Department of Development (online) May 21, 2021.

Assessing Economic Impacts and Realizing Economic Opportunities, presentation to the Board of Directors, Windsor Detroit Bridge Authority, June 19, 2020; presentation to the International Authority, Windsor Detroit Bridge Authority, November 18, 2020.

The Gordie Howe International Bridge and the Binational Great Lakes Region: assessing economic impacts and realizing economic opportunities, (with Ms. Marta Leardi-Anderson) online seminar for the Deputy Minister and senior staff of Infrastructure Canada, August 19, 2021.

Infrastructure's Impact on Economic Growth: Harnessing the potential in the Ontario – Michigan/Ohio corridor, Webinar by the Chartered Institute of Transportation and Logistics, September 22, 2021.

International Travel Restrictions, Technology and Governance in Post-Covid Cities, 1st Conference on Asia Inclusive Smart Cities in the Post-Covid Arena, November 25, 2021

Consultation to UK Cabinet Office, Round Table on Review of HMC Presence at the Border, January 18, 2022.

Cross-Border Freight: Key Issues for Canadian Competitiveness and Effects of Covid-19, Transport Canada, February 9, 2022. (part of a staff training event in association with CILTNA.)

The Gordie Howe International Bridge: The Politics, Economics and Procurement of a Major Infrastructure Project, Windsor Chapter of the Canadian Institute of Transportation Engineers, March 22, 2022.

Cross-Border Supply Chains and Canada-US Trade: Infrastructural, Technological, and Organizational Improvements, McMaster Institute for Transportation and Logistics, April 13, 2022.

Selected Invited Speaking Engagements (delivered by Marta-Leardi Anderson)

Wilson Center Book Talk: Beyond 9/11 Homeland Security for the Twenty-First Century discussion panel, broadcast December 14, 2020

Wilson Center, Congressional Staff Briefing, The Nature of Canada- US Trade and Blockade, February 14, 2022

Wilson Center, The US-Canadian Boarder: Recovering from COVID 19, Task Force Presentation and Discussion, January 2021

Interview, LIVE, National Public Radio Marketplace, Border Restrictions

Interview, Politico, February 18, 2022, Border Restrictions at the Canada-US Border

Chartered Institute for Logistics and Transportation, North America, Key Note Speaker, November 4, 2019

Women in Transportation, Michigan Chapter, Key Note Speaker, January 2020

Selected Invited Speaking Engagements (delivered by Laurie Tannous)

Livestream w/ Dr. Bill Anderson and Laurie Tannous – April 23, 2020 – The state of International Trade & Border Management in the days of Covid-19

CBC news interview – March 1, 2022 - New rules simplifying cross border travel start today, but they're not so simple

US-Canada Trade: On the Ground at the Entry Points (NASCO) – June 14, 2020 – Speaker

Midwestern Legislative Conference (MLC) Midwest-Canada Relations Committee – July 2022 – Speaker

Lawyers face a new digital work reality. An interview with Laurie Tannous. | InspireHUB – April 2020

ITS Canada 2022 – Bridging Mobility Corridors – May 2022 – Speaker

Canada-Mexico Relationship in Perspective – March 2019 – Speaker

Community Service (William Anderson)

Member, North American Competitiveness Working Group, G. W. Bush Institute Dallas TX, 2020-21.

Founding Member, U.S – Canada Innovation Partnership, U.S. Consulate, Toronto, 2019-present.

Board Member, GTA Chapter of the Chartered Institute for Logistics and Transportation

Member, Expert Advisory Table, Privy Council Office, Government of Canada, 2017

Member, Local Organizing Committee, *NASCO Continental Reunion,* Windsor, October 2015.

Member, Board of Directors, Workforce Windsor-Essex, 2010-2016

4 Research Funding

4.1 Academic Grants

Grant Year(s)	Source	Total Amount	Amount Allocated to CBI Researchers	Principal Investigators	Purpose**	Project Title
2021-2023	Mathematics of Information Technology and Complex Systems (MITACS)	CAD 160,000	50%	Rupp Carriveau and Hanna Maoh	Research	Modeling the Grid Impact of Long Haul Electric Vehicles (LHEVs) in Ontario
2018-2023	Scotiabank	CAD 100,000	100%	William Anderson	Research	Scotiabank Global Trade

						Transactions Initiative
2020-2022	FedDev Ontario	CAD 326,000	36.81%	Chris Lee Hanna Maoh and Yong Kim	Research	Traffic Sensor Data Analysis and Modeling for Building Intelligent Transportation Systems
2019-2022	Canada Foundation For Innovation - John Evans Leaders Fund	CAD 150,692	100%	Hanna Maoh and William Anderson	Equipment	Real-time Traffic Monitoring System for Studying Traffic at Canada's Busiest Land Border Crossing
2017-2022	Natural Science and Engineering Research Council (NSERC)	CAD 105,000	100%	Hanna Maoh	Research	Mining, Fusion and Modeling of Truck Big Data for the development of Agent- Based Microsimulation Models
2017-2019	SOSCIP	CAD 25,000	100%	Hanna Maoh	Research	Short-term Prediction of Border Crossing Times for Trucks
2015-2019	Social Science and Humanity Research Council	CAD 241,850	100%	William Anderson and Hanna Maoh	Research	Vulnerability, Criticality and Resilience in Freight Networks: The Case of Southern Ontario, Grant
2017-2018	SOUTHERN ONTARIO SMART COMPUTING INNOVATION PLATFORM CONSORTIUM	CAD 82,000	100%	William Anderson and Hanna Maoh	Research	Short-term prediction of border crossing times for trucks
2013-2018	Automotive Partnership Canada (NSERC)	CAD 1,846,800	5.41%	Pavlos Kanaroglou, Hanna Maoh and Others	Research	The Social Costs and Benefits of Electric Mobility in Canada
2012-2017	Canada Foundation for Innovation (CFI)	CAD 231,434	50%	Chris Lee and Hanna Maoh	Equipment	Laboratory for Integrated Transportation and Traffic Engineering Research
2013-2016	Fed Dev Ontario	CAD 7,291,781	100%	William Anderson	Research	Institute for Border Logistics and Security (Joint Venture with City of Windsor)
2011-2016	Natural Science and Engineering Research Council of Canada (NSERC)	CAD 122,500	100%	Hanna Maoh	Research	Developing Integrated Microsimulation Models for Intra-Urban, Inter-Regional and Cross Border Freight Transportation: An Application to Ontario, Canada
2011-2016	Natural Science and Engineering Research Council of Canada (NSERC)	CAD 122,500	100%	Hanna Maoh	Research	Developing Integrated Microsimulation Models for Intra-Urban, Inter-Regional and Cross Border Freight Transportation: An Application to Ontario, Canada

4.2 Contracts

Grant Year(s)	Source	Total Amount	Amount Allocated to CBI Researchers	Principal Investigators	Purpose**	Project Title
2021-2023	Family Services Windsor-Essex	CAD 120,480	100%	Hanna Maoh	Research	Maintaining Affordability through ADUs: A Tracking and Analysis Model
2018-2021	Health Canada	CAD 500,000	79.6%	Hanna Maoh and Tor Oiamo	Research	Integrated Urban Modeling
2020-2020	Transport Canada	CAD 22,000	100%	William Anderson	Research	Freight Innovation in Canada: Adoption of Disruptive Technologies
2018-2019	Battelle Memorial Institute	CAD 102,008	100%	William Anderson	Research	Revise and Update JOBMOD Spreadsheet Tool
2017-2018	Windsor-Detroit Bridge Authority (WDBA)	CAD 215,000	100%	Hanna Maoh	Research	Traffic Impact Planning Model Project
2017-2018	SOUTHERN ONTARIO SMART COMPUTING INNOVATION PLATFORM CONSORTIUM	CAD 82,000	100%	Hanna Maoh and William Anderson	Research	Short-term prediction of border crossing times for trucks
2016-2018	Windsor-Detroit Bridge Authority	CAD 1,000,000	100%	William Anderson	Research	Windsor-Detroit Bridge Authority Economic Impact Study
2016-2016	Union Gas	CAD 54,995	100%	Hanna Maoh	Research	Fueling Infrastructure and Freight Transportation Routing
2015-2015	Canadian Border Services Agency (CBSA)	CAD 25,000	100%	Hanna Maoh	Research	Primary Inspection Kiosk Operational Design Modelling
2014-2015	Transport Canada	CAD 25,000	100%	Hanna Maoh	Research	Competitiveness of Canadian Gateways in North America
2010-2013	Ministry of Transportation of Ontario (MTO)	CAD 115,738	100%	William Anderson and Hanna Maoh	Research	Assessing the Regional Economic Impacts of a Major Highway Infrastructure Project: The Windsor- Essex Parkway
2009-2012	US DOT	US 63,490	100%	William Anderson	Research	Employment Impacts of Transportation Expenditures Under the American Recovery and Reinvestment Act

4.3 Other

Memorandums of Understanding (MOUs)

- Memorandum of Understanding with the University of Chelm, Chelm, Poland
- Memorandum of Understanding with Akademia Sztuki Wojennej, Warsaw, Poland
- Draft Memorandum of Understanding with the Canada Border Services Agency
- Draft Memorandum of Understanding with Gowlings

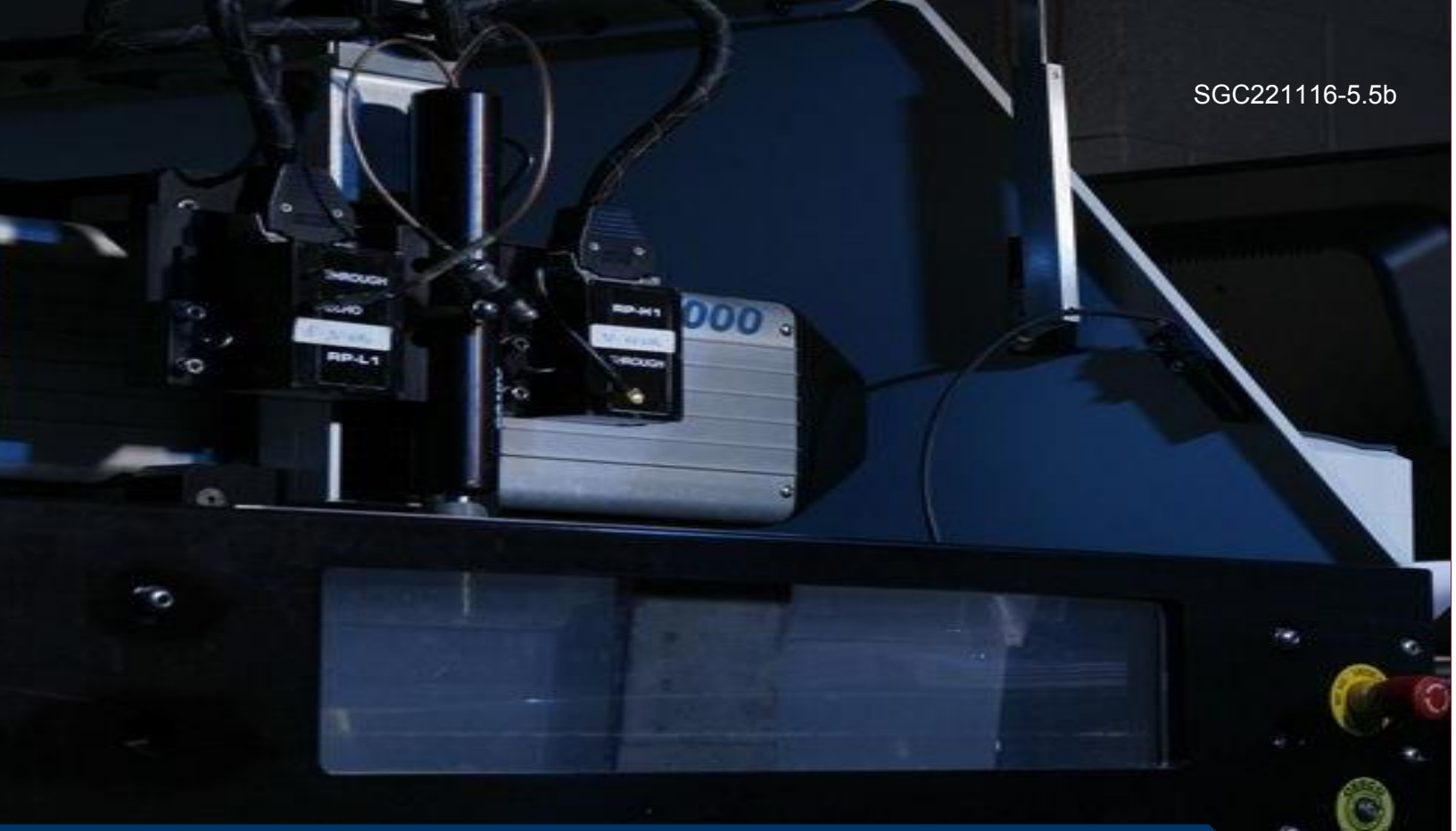
Networking

The CBI has established strong relationships with several Canadian Federal agencies including Statistics Canada, Transport Canada, Health Canada and the Canada Border Services Agency. This has been possible through the work that the CBI research group has done for these agencies. That has also led to job placements for four of the graduate students who trained in the Traffic Lab of the CBI at Statistics Canada since 2014.

5 Certificate Programs

Through funding provided by FedDev Ontario, the CBI was able to establish what is now called the **International Trade and Border Management Certificate (ITBM) Courses**. In its' first iteration, the ITBM courses were focused on the movement of people and goods across the Canada-US Border and aimed at those individuals working in fields that were impacted by these cross-border movements. With additional funding from the Scotiabank gift to the University, CBI was able to dedicate substantial course material to the movement of funds across border, or Trade Finance modules, called **Global Payments and Trade Finance**.

As part of CBI's Continuing Education program in Border Management and International Trade, the CBI is currently working with Continuing Education on the delivery of the next iteration of these modules.



INSTITUTE FOR DIAGNOSTIC IMAGING RESEARCH

FIVE-YEAR REPORT

Updated

University of Windsor

2022

CONTENT

TOP STORIES ABOUT IDIR

Click on the link to go to the webpage.

UWindsor Daily News

Virtual celebration recognizes faculty and student accomplishments in research, scholarship, and creative activity, Oct 3, 2022

Research in non-destructive testing earns plaudits for students, May 26, 2022

Application of AI to revolutionize automotive production, August 5, 2021

New company born of UWindsor research, January 23, 2019

Seminar to explore interface of biology and engineering, May 3, 2018

Conference considers new techniques to analyze art, July 7, 2016

Mayor tours UWindsor's Institute for Diagnostic Imaging Research, Aug 13, 2015

Other

Enwin-UWindsor collaboration creates anti-corrosion spray for equipment, CBC, January 22, 2019

Enwin, university research institute launch new company in Windsor, Windsor Star, Jan 22, 2019

University of Windsor research team gets $5.5M, Windsor Star, May 11, 2018

UWindsor's Institute for Diagnostic Imaging Research gets $5.5M, CTV Windsor, May 10, 2018

ABOUT THIS REPORT

STATISTICS This report represents the years 2015-September 2022 unless indicated otherwise.

RESEARCH FUNDS Grants and contracts.
Studentships, salary awards are excluded.

RESEARCHERS Individuals conducting active and independent research.

STAFF

PUBLICATIONS Selected from 2015 to 2022. The complete list of publications is in Appendix 1.

COUNTS The cumulative numbers of active researchers and research trainees as of September 2022.

IDIR IN NUMBERS

13

Active researchers

79

HQP trained

22

Staff in research and administration

58

Peer-reviews publications:
13 books/book chapters/ editorials, 45 articles

112

Scientific talks given by our researchers worldwide

11

Research collaborations with international partners

26

Research Grants and Contract

$10,967,225

Total funds received

29

Research Projects

2

Spin-off companies

19

Patents:
14 issued and 5 filed

7

Community serving projects

Who we are

Established in 2008, the University of Windsor created the Institute for Diagnostic Imaging Research (IDIR) as a regional innovation research centre in southwestern Ontario to develop and commercialize innovative diagnostic imaging technologies for industrial, biomedical and biometrics applications**.** Under the leadership of Dr. Roman Maev, IDIR has been consistently recognized as a world leader in developing innovative technologies.

Today, IDIR commercializes its technologies and creates spin-off companies selling products to multinational private sector companies and healthcare service providers globally.

MISSION

The Institute for Diagnostic Imaging's (IDIR) Mission Statement is three-fold:

1. To conduct novel imaging research and innovation projects that encompass all elements of the innovation value chain, from fundamental discovery to the commercialization of globally competitive products and services.

2. To foster the growth of collaborative partnerships and commercialization opportunities locally, nationally and globally.

3. To provide enhanced learning opportunities that will assist with developing highly qualified personnel, or HQP, who will nurture the IDIR's legacy while continuing its journey of discovery.

PEOPLE

FACULTY

Roman Maev

In 1995, Dr. Roman Maev was appointed a Full Faculty Professor in the Department of Physics. In 2002 he became a Chairholder of the DaimlerChrysler Industrial Research Chair. Since beginning his research activity in Canada in 1995, he has received over $30 million in support from various industrial partners and government agencies. In 2008, Dr. Maev became a Founding Director General of The Institute for Diagnostic Imaging Research—a multi-disciplinary, collaborative research and innovation consortium. The extraordinarily diverse range of disciplines encompassed by Dr. Maev's work includes theoretical fundamentals of physical acoustics, experimental research in ultrasonic and nonlinear acoustical imaging, and the theory of propagation of waves through layered structures. As of 2022, he has published a total of 611 peer-reviewed acticles, including 27 books and chapters in books, 155 articles, 429 refereed conference proceedings, 63 patents issued and/or filed.

Throughout his career, Dr. Maev, with his colleagues, developed the theory of ultrasound wave propagation through materials. In 1978, Maev designed and built the first high-resolution (500 MHz) transmission-mode scanning acoustic microscope. Dr. R. Maev and Dr. A. Atalar, and Dr. A. Briggs in 1980 were invited to be consultors at the Ernst Leitz Wetzlar, GmbH (Germany) to build the first commercial SAM ELSAM. In 2001, Dr. Maev developed a novel handheld high-frequency ultrasonic imaging system to characterize materials such as metals and alloys, ceramics, composites and polymers.

Roman Maev is the recipient of numerous national and international awards for his innovations, research discoveries, and inventions. He has mentored over 220 graduate and undergraduate students, many of whom have gone on to leadership positions in academic and private sectors worldwide.

Majid Ahmadi

Dr. Majid Ahmadi is a University Professor and Director of the Research Center for Integrated Microsystems. His research interests include digital signal processing, machine vision, pattern recognition, neural network architectures and VLSI implementation, and computer arithmetic.

Dr. Ahmadi is the regional editor for *Circuits, Systems and Computers* and the Associate Editor for the *Pattern Recognition* journal. He was the IEEE-CAS representative on the Neural Network Council and the Chair of the IEEE-CAS Neural Systems Application Technical Committee. Dr. Majid Ahmadi was the recipient of an Honorable Mention award from the Editorial Board of the Pattern Recognition journal in 1992 and received the Distinctive Contributed Paper award from Multiple-Valued Logic Conference Technical Committee and the IEEE Computer Society in 1999. He is a Fellow of the IEEE (USA) and a Fellow of IET (UK).

Andrzej Sobiesiak

Dr. Andrzej Sobiesiak is Professor and Head of the Mechanical, Automotive and Materials Engineering Department at the University of Windsor. His research interests lie in the field of internal combustion engines, alternate fuels and measurements in flows & flame. He focuses his research on combustion process modifications and re-organization on reducing or eliminating the need for after-treatment technologies for internal combustion engines and industrial burners that use both premixed and non-premixed flames. The technology is based on three functional ingredients: mixing of fuel with air in high-intensity and small-scale turbulent flows, mixing of fuel with combustion products (EGR) or partial oxidation products to achieve fuel reformation, mixing of air with combustion products (EGR) or partial oxidation products in HISS flows. Dr. Sobiesiak has worked on industry-sponsored projects for FCA, Ford Canada Dofasco, Stelco, Canadian Gas Research Institute, British Gas, Rolls Royce, and Air Liquide.

FACULTY

William Altenhof

Dr. William Altenhof's research interests deal with safety and large materials deformation using numerical, experimental and theoretical techniques. His contributions in child safety have resulted in creating a number of devices and systems to reduce injury to toddlers in frontal and side automobile crash situations. Dr. Altenhof's research group has also achieved the development of an ideal energy absorber that can be tuned for an extensive range of applications with use in the personal safety equipment, automotive, defence, and aerospace industries. His work in child safety and energy absorbers has achieved international interest, and collaborations with many countries outside of North America have been developed.

Sazzadur Chowdhury

Dr. Sazzadur Chowdhury is a Professor in the Department of Electrical and Computer Engineering at the University of Windsor. His research interest includes MEMS sensors and actuators, high-performance capacitive Micromachined Ultrasonic Transducers (CMUTs), and MEMS-based radar sensors for automotive collision avoidance.

His research focus is to develop an array cluster capable of detecting information concurrently in the acoustical and microwave portions of the spectrum that can be used in medical diagnostics, industrial applications, and identification and security applications using biometrics. He is a professional engineer in the province of Ontario and a member of IEEE.

Vesselin Stoilov

Dr. Vesselin Stoilov is a Professor at Mechanical, Automotive & Materials Engineering. Dr. Vesselin Stoilov's research interests include micro/nanoscale mechanics & tribology, characterization and modelling of active materials (shape memory alloys, piezoelectric, ferroelectric, and magnetostrictive materials), multi-scale modelling, design and characterization of N/MEMS. Dr. Vesselin Stoilov has authored multiple peer-reviewed scientific papers and presented works at many national and international conferences. His contributions have acclaimed recognition from honourable subject experts around the world.

Elena Maeva

Dr. Elena Maeva is a Professor at the Department of Physics. She is also cross-appointed with Chemistry and Biochemistry Department. Her research interests are material science, biomedical physics, ultrasound, acoustic microscopy, nondestructive testing. Dr. Maeva has experience developing ultrasonic methods for nondestructive evaluation and quality control in the automotive industry. She has worked on industry-sponsored projects for Chrysler, Ford and other OEMs. She is a co-author of six patents in this field.

Dr. Maeva is an expert in high-frequency ultrasonic biomedical imaging. Her research in this area, funded by the Ontario Brain Institute and Office of Naval Research, led to the development of a novel methodology of transcranial ultrasonic imaging of brain structures, blood vessels and foreign objects for diagnosis and treatment of brain injuries.

FACULTY

Balakumar Balasingam

Dr. Balakumar Balasingham is an Assistant Professor at the Department of Electrical and Computer Engineering, University of University. His research expertise is in developing algorithms for autonomous {cyber, physical, human} systems, namely, cyber-physical systems, cyber-human systems, human-physical systems (also known as human-machine systems). His research interests include autonomous (cyber, physical and human) systems, signal processing, machine learning, information fusion. Dr. Balakumar Balasingham is co-directing/directing the Battery Management Systems Laboratory (BMSLab), Surveillance and Tracking Systems Lab, and Human Systems Lab (HSLab) at the University of Windsor. Dr. Balasingam is a Senior Member at the Institute of Electrical and Electronics Engineering (IEEE) and a member, International Society of Information Fusion (ISIF). Dr. Balasingam has published numerous publications in various national and international peer-reviewed journals and presented scientific papers worldwide.

Robin Gras

Dr. Robin Gras is a Professor in the School of Computer Science. He is cross-appointed by the Biology Department and the Great Lakes Institute for Environmental Research. Dr. Gras' research interests are machine learning, deep learning, artificial life, theoretical biology, ecosystem simulation, bioinformatics, combinatorial optimization. From 2000 to 2002, he was a consultant for GeneProt Inc. concerning the automation of protein identification and characterization process. Dr. Gras is a CSO and partner at Movyl Technology and MVYL Associates (San Francisco). Movyl Technologies offers an AI automation platform to discover and automatically share unique content tailored to social media accounts. Mvyl Associates provides AI consulting for small, medium and large companies acquiring the knowledge and tools needed to integrate and execute AI in their strategic roadmap.

Jonathan Wu

Dr. Jonathan Wu is a Professor at the Department of Electrical and Computer Engineering. He is a world-leading expert in the field of computer vision and machine learning. His current research interests include 3-D computer vision, active video object tracking and extraction, interactive multimedia, sensor analysis and fusion, and visual sensor networks. Dr. Wu holds the Tier 1 Canada Research Chair in Automotive Sensors and Information Systems. He leads the Centre for Computer Vision and Deep Learning, Department of Electrical and Computer Engineering, which focuses on quality research in computer vision, deep learning, wireless sensor networks, and sensor data fusion techniques. Dr. Wu is a Senior Member at IEEE and is an Associate Editor of the IEEE Transactions on Systems, Man, and Cybernetics-Part A, and the International Journal of Robotics and Automation. He has authored or co-authored more than 250 peer-reviewed articles in computer vision, image processing, intelligent systems, robotics, and integrated microsystems.

Daniel Green

Dr. Daniel Green's reseaerch has largely focused on industrial research in sheet metal forming and tube hydroforming. Daniel joined the Department of Mechanical, Automotive & Materials Engineering at the UWindsor in 2004, and was awarded a Canada Research Chair for the Development & Optimization of Metal Forming Processes (2005-2015). Daniel obtained the University's first APC (Automotive Partnership Canada) award in 2012 ($1.8M research project) to carry out research on electrohydraulic forming, a novel high-velocity forming process. Daniel has also received research funding from NSERC, Auto21, OCE, MITACS and support from the automotive manufacturers such as Ford, Valiant Machine & Tool, Novelis Inc., ArcelorMittal Dofasco, VariForm, Marwood Int. and the Narmco Group.

STAFF

Research Associates	Other Research Staff	PDFs
Emil Strumban	Damir Ziganshin	Dmitry Gavrilov
Fedar Seviaryn	Egor Sanin	Kiyan Shapoori
Volf Leshchynsky	Serge Zhelnakov	Moin Bhuiyan
Andriy Chertov	Jason Taylor	Waldo Perez Regalado
Dmitry Dzhurinskiy	Zygmunt Baran	Ahmed Elseddawy
Aryaz Baradarani	Lincoln Kim	Andrew Ouellette
Jeff Sadler	Adrian Wydra	Majid Nezakat
Mircea Pantea	Boris Reingold	Ryan Scott
Serge Titov	Greg Schreiner	Po-Jen Chu
	Raymond Belenkov	Konstantin Borodianskiy
	Sarah Beneteau	Inna Seviaryna
	Suong Mancini	
	Sabina Howell	

HIGHLY QUALIFIED PERSONNEL

The complete list of graduate students' theses / dissertation defended is in Appendix A on page 22.

HQP	2015	2016	2017	2018	2019	2020	2021	2022
Undergrads	14	4	2	6	9	8	6	5
International UG (exchange/Mitacs/collaboration)	5	3	2	1	1	1	0	1
Masters	3	6	5	4	3	1	4	4
PhD	4	5	5	5	5	6	3	4
PostDoctoral	7	4	2	3	3	4	4	3
TOTAL HQP	**33**	**22**	**16**	**19**	**21**	**20**	**17**	**17**

WHAT WE ACHIEVED:

The IDIR framework of records is shown below for the following criteria: research, HQP training, innovation.

IDIR is an internationally recognized research institution for research, training and educational outreach in diagnostic imaging technologies for industrial, biomedical and biometrics applications.

CORE RESPONSIBILITY: RESEARCH

IDIR research is internationally competitive	Collaboration with 11 countries 70 invited and keynote presentations worldwide
IDIR research is strengthened	29 research projects with over $10M of total funding 3 main research directions 14 industrial partners

CORE RESPONSIBILITY: HQP TRAINING

IDIR training capacity is strengthened	79 HQP trained 21 Defenses
EDI capacity of IDIR is strengthened	Women's representation among students has been increased to 28% overall and 25% for PhD students (21% and 20% average in Canada/USA, correspondingly[1, 2]). 40% of students are visible minority.

CORE RESPONSIBILITY: INNOVATION AND COMMERCIALIZATION

IDIR innovation capacity is has strengthened	2 spin-off companies created 19 patents (14 issued, 5 filed)
IDIR is a valued neighbour in the community	7 projects to assist organizations serving the community

[1]A. Porter, R. Ivie, Women in Physics and Astronomy, 2019, https://www.aip.org/statistics/reports/women-physics-and-astronomy-2019#files
[2]A. Predoi-Cross et al. Update of the status of women in physics in Canada, AIP Conference Proceedings 2109, 050010 (2019); https://doi.org/10.1063/1.5110084

COLLABORATION:

TIES THAT BIND

INDUSTRIAL

The development of new nondestructive diagnostic and testing systems has many applications in manufacturing-related quality assurance processes and the development and characterization of advanced materials. This technology is vital to many industries, including the automotive, aircraft, energy and agriculture sectors.

BIOMEDICAL

The development of non-intrusive medical diagnostic technologies and systems that have many applications in medical diagnostics, including the detection of cancer, heart disease, lung traumas, dental diseases, etc. The research focuses on developing core enabling technologies, systems and commercial products that will potentially detect critical illnesses at their most curable stage and in many cases when they are least costly to treat.

BIOMETRICS

The development of new non-intrusive imaging devices and systems employing acoustical energy and other technologies has many applications in the identification and security fields. The ability to non-intrusively image structures on and below the surface of the skin of a subject under test enables the use of new biometric parameters that can be used to identify a person or biomass with great accuracy and reliability.

The complete list of collaborative research projects is in Appendix B on page 24.

OUR PARTNERS

COMMERCIALIZATION

Two spin-off companies created:

2015

The True Phantom Solutions

2018

The ONtech Rapid Coating

One of the features that make the Institute for Diagnostic Imaging Research (IDIR) so unique and so valuable to our clients is that in addition to the cutting-edge research performed by our scientists—and indeed, as a complement to it—we also address the business development aspects of many of the commercially viable products that we help to develop.

Our team has tremendous experience in liaising with government agencies, universities, and private corporations around the globe—giving our clients the edge in the competitive marketplace of today. Our clients put the IDIR's business acumen to work for them, and they see results that give them the upper hand.

SPIN-OFF COMPANIES

As a result of the joint academic and commercialization activities of IDIR, two spin-off companies were successfully created: one of them in 2015, "The True Phantom Solutions," specialized in design, development and production of bio-phantoms with unique properties. Today, after only five years, this is a well-known global company with an impressive line of their original products. The second company is "The ONtech Rapid Coating," created in 2018 and specialized in the novel Cold Spray Technology and which already developed various unique applications.

ONTECH RAPID COATINGS

Ontech Rapid Coatings was launched in 2018 through an ENWIN Energy and Tessonics Inc. partnership that has developed cutting-edge corrosion control and coating solutions for cost-saving opportunities for the utility, automotive and aeronautics sectors across North America.

The solutions used by ONtech uses Dual-Flow Cold Spray (DFCS) technology and can be employed across various industry assets to prevent and stop the spread of corrosion damage for corrosion-prone equipment components.

TRUE PHANTOM SOLUTIONS

True Phantom Solutions, created in 2015, offers novel technology to fabricate unique materials with realistic physical and mechanical properties similar to properties of human tissues. Highly realistic anthropomorphic phantoms are compatible with ultrasound imaging, MRI and CT. Phantoms are used to test and calibrate new medical devices, training students, and treatment planning and targeting before applying the new non-invasive surgical HIFU procedures.

True Phantom Solutions Inc. (TPS) reproduces the properties and structures of the human body using modern technology and synthetic tissue materials. The phantoms are critical for developing innovative diagnostic imaging techniques, neurosurgical treatment planning, and training medical students.

AWARDS

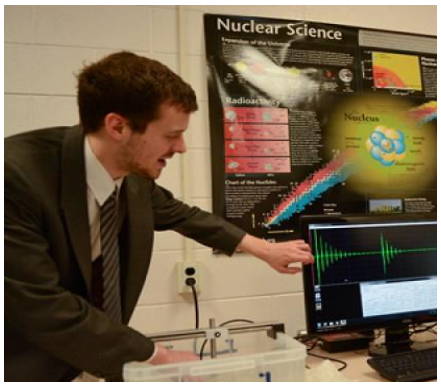
ROMAN MAEV

2022	Fellow, ASNT
2022, 2021	Award in Recognition of Research and Scholarship Excellence from University of Windsor
2020	ASNT Mentoring Award
2020	University of Windsor Recognition for Canadian Patent and The BINDT Roy Sharpe Award
2020	University of Windsor Award for Significant Mitacs Accelerate Grant
2020	Award for Second Place, Top-20 Innovation Start-up Companies by The Russian Society of Nondestructive Testing and Technical Diagnostics
2020	Award in Recognition of being accepted to the Top-20 Innovation Start-up Companies by The Russian Society of Nondestructive Testing and Technical Diagnostics
2019	Named Academician of the Russian Academy of Sciences
2018	Roy Sharpe Award (awarded 2019) in recognition for outstanding contribution to NDT awarded by the British Institute of Nondestructive Testing.
2017	Russian Order of Friendship Medal for promoting Canadian-Russian relations.
2016	ASNT Outstanding Paper 2016, Grain Size Measurements of Copper Spot Welding Caps Via Ultrasonic Attenuation and Scattering Experiments, American Society for Nondestructive Testing.
2015-16	IEEE Distinguished Lecturer Award.
2015	Best Paper Award for 2014, A Review of Imaging Methods in Analysis of Works of Art: Thermographic Imaging Method in Art Analysis, Canadian Journal of Physics.

Dr Roman Maev is presented with the Roy Sharpe Prize by Karl Quirk

AWARDS

HQP AWARDS



Andrew Ouellette
https://www.uwindsor.ca/dailynews/2014-06-25/medical-physics-lab-providing-hands-training

Andrew Ouellette
2020, 2022 oNDuTy Post-Doctoral Fellowship
2019 Tom and Mylo Drake Research Excellence Award
2018 Faculty of Science GA Excellence Award

Vlad Tusinean
2022 1st place MSc presentation, OnDuTy Annual meeting

Ahmed Elseddawy
2020 Mitacs Globalink Internship

Danilo Stocco
2020 oNDuTy graduate internship

Bartosz Slak
2018 Medical Device Innovation Fellow
2016 Mitacs Globalink and Mitacs Accelerate Internship

Anita Gregorian
2022 oNDuTy Graduate Internship

Zareen Reza
2018 oNDuTy graduate internship
2018 Third Prize in Thales' 2018 Student Innovation Championship

Andrew Chertov
2016 Outstanding Paper in Research in Nondestructive Evaluation Award

Ryan Scott
2019-2022 Mitacs Accelerate Internship

Maryam Shafiei Alavijeh
2022 2nd place prize for PhD presentation, OnDuTy Annual meeting
2020 3rd place prize for PhD presentation, OnDuTy Annual
2019-22 Mitacs Accelerate Internship

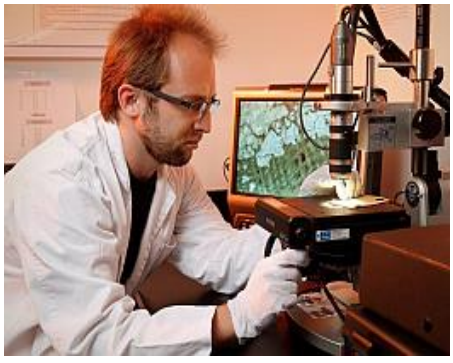
Ariya Rasekh
2020-2021 Mitacs Accelerate Internship

Majid Nezakat
2019-2021 Mitacs Accelerate Internship

Iarid Gomez
2020-2021 Mitacs Accelerate Internship

Mahdi Hashemi
2019 Mitacs Accelerate Internship

Adrian Wydra
2014 OBI/OCE ONtrepreneurs Program Award



Dmitry Gavrilov

Dmitry Gavrilov
2018 oNDuTy Post-Doctoral Fellowship
2015 Best Paper Award for the 2014 Canadian Journal of Physics

Kiyanush Shapoori
2015 OBI ONtrepreneurs Program Award

PROJECT HIGHLIGHT

Development of a new adaptive spot weld controller driven by an ultrasonic monitoring system

The project aims to design a high-tech 'smart' spot welder combining ultrasound and Artificial Intelligence (AI) to dramatically improve the quality of welds in automotive body mass manufacturing. "Our new and innovative approach for 'zero-defective' mass-manufacturing production using ultrasonic real-time monitoring of bonded joints quality is based on deep learning neural network," says physics professor Roman Maev.

$962,000

Colalborative partnership funding

NSERC

Canadian Electrocoating Ltd.

Nadex Co. Ltd. (Japan)

Resistance welding typically employs 4,000 to 6,000 individual spot welds on each vehicle. The IDIR team has developed a state-of-the-art quality monitoring technology that incorporates an ultrasonic sensor to boost quality of joining. We've created a smart device that uses AI to learn how to improve welding. Original algorithms allow the system to make immediate decisions and send an in-line request to the welder to make modifications to ensure the quality of each weld.

This partnerships create incredible opportunities for training students in real-world applications and helping them learn skills in a manufacturing environment. Students will get direct experience with industrial plants and be involved with science communications with international industrial partners. Even without travel, this is a great networking and learning opportunity for undergraduates and graduate students alike.

The project outcomes will completely revolutionize the mass-manufacturing process using artificial intelligence at automotive assembly plants globally, bringing big savings in production cycle time, reducing labour costs, and eliminating unnecessary destructive tests.

https://www.uwindsor.ca/vp-research/379/significant-grants-and-awards-external-agencies

PROJECT HIGHLIGHT

Novel Quantitative Nondestructive Quality Evaluation of Advance Joining and Consolidation Manufacturing Processes

This project aims to develop and test resilient coatings and tools for their application and nondestructive ultrasonic testing methods that can be done on-site for efficiency. The initiative involves the federal government and five industry partners: Bombardier, Ford Canada, Canadian ElectroCoating Ltd./Narmco, Enwin Energy, and the Consortium for Aerospace Research and Innovation in Canada.

"Through negotiation with all of our partners, we will use variations on the same technologies, nondestructive testing and protective coatings to target the industry-specific challenges in each of the companies involved," said Dr. Maev. "Being able to diagnose and fix flaws in machinery on-site will also save time and money. This is the ideal — clustering the technology so it serves many needs, is a more efficient use of research resources and benefits most users. This project is unique because each industrial partner has its own independent interests, priorities, IP, and management style. It's a complicated project arrangement that requires vast knowledge and experience, as well as the faith and cooperation of all partners."

Council Director of Manufacturing, Communication and Technology Pamela Moss says this is a unique project. "It's exciting because of the different companies that are coming together; sometimes we see either a collaboration between one company and the university and a number of resources and research, but to see different ones, Bombardier from aerospace, Ford from the automotive sector and energy company."

DailyNews, https://www.uwindsor.ca/dailynews/full-issue/2018-05-14

$5,488,206

Collaborative funding

NSERC

Ford

Enwin

Bombardier

Narmco

Consortium for Aerospace Research and Innovation in Canada

PROJECT HIGHLIGHT

Nondestructive evaluation of PE pipe joints using ultrasound and deep learning, with Jana Corporation

Mitacs Accelerate projects with

Jana Corporation ($210,000) and

InDepth Technologies Inc. ($150,000)

The use of polyethylene (PE) plastic pipes for transporting and delivering gas and water has increased over the last few decades. The integrity of PE pipe joints should be examined to eliminate potential leakage and maximize public safety, yet it has been a challenge.

As a result of the proposed research, we have developed a prototype of the portable device involving advanced ultrasound technology based on chord transducer to non-destructively assess the quality/integrity of the butt fusion (BF) welds in PE pipes. The part of this development was the artificial intelligence (AI) algorithm for defect classification, which has been incorporated into the device prototype.

The development and manufacture of the proposed technology will enable Canadian gas distribution companies to conduct a nondestructive inspection of gas pipeline construction, maintain their safety and ensure the quality of work while decreasing the cost, ultimately increasing their revenue. An advanced ultrasonic technique utilizes chord-type transducers for flaw detection in pipes. AI-based inference systems reduce error-proneness, material waste, and inspection times. This automated "smart" quality control method aligns with NDE 4.0 platform requirements, which assist in achieving reliable and real-time inspection. A pilot development for modern human-machine interaction using assistive technologies will bring ultrasonic inspection on a high-level corresponding to current and future standards. With the successful commercialization of this technology, Canada will be at the forefront of cutting-edge PE pipe joints inspection practices.

SERVING COMMUNITY

Institute for Diagnostic Imaging Research operates with the greater community in mind — the same way it has from its inception. Today, the IDIR is dedicated to outreach, education, professional development and economic growth.

COMMUNITY OUTREACH

Biannually, the IDIR hosts tours during the university's Open House Days, a family-friendly event that attracts many people to campus. The open house day at the IDIR often includes demonstrations giving visitors the chance to learn more about physics, research and innovation.

IDIR researchers give presentations and tours to community groups, University faculty members, and students throughout the year. IDIR members regularly give presentations on graduate seminars at the Department of Physics and participate in Think Tank events organized for the Windsor-Essex community to ignite ideas and move into research collaborations. "It's important that the university community and general public know about the research going on at the IDIR," Prof. Maev said. "Our goal is to always operate in a spirit of openness so that we can continue to have the community's trust."

"Our goal is to operate in a spirit of openness so that we can continue to have the community's trust."

SHAPING FUTURE RESEARCH

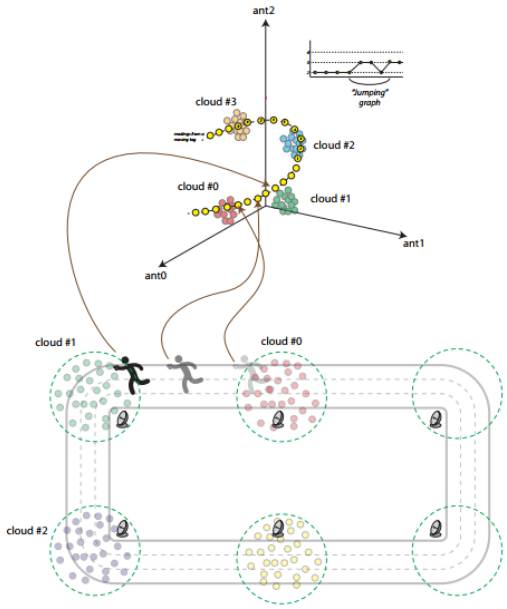
The IDIR reaches out to school districts to help educate students. IDIR hires school students during the summer to inspire them to become interested in science, research and learning. The IDIR is guiding future research that will propel Canadian science excellence and Ontario's economy. Scientists from around the world visited the IDIR in the period from 2015 to 2022.

The IDIR also helps train the next generation of researchers. Students from Japan, Brazil, Poland, Emirates visited the IDIR to receive cutting-edge training in the field of acoustic microscopy and ultrasonic nondestructive evaluation. In the last seven, fifty-three University of Windsor undergraduate students have had opportunities to assist with the institute's research projects and enhance their career prospects.

SERVING COMMUNITY

ASSISTING CARDIAC REHABILITATION

Automated RFID-based system to monitor patients at running track exercises

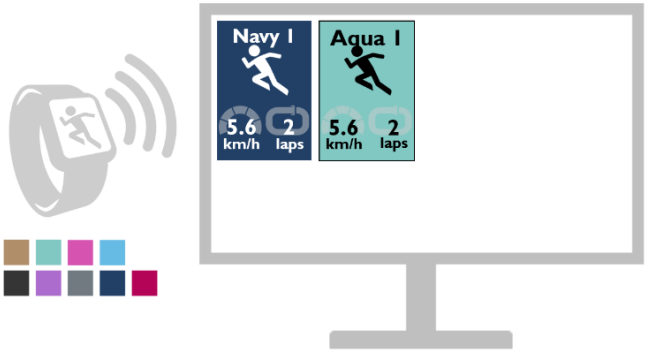


Since 2017, the IDIR has been working closely with the Hotel-Dieu Grace Healthcare (HDGH) to develop and install an automated system for attendance to patients performing running track exercises.

Cardiac rehabilitation is an integral part of healthcare directed towards recovering after heart attacks, improving cardiovascular health, and minimizing the risk of cardiovascular problems in the future. Traditional running track exercises often require constant supervision by medical staff and keeping records on health parameters.

The system is based on a constellation of Radio-Frequency Identification (RFID) antennas, and radio transmitters embedded into wearable bracelet-type devices that keep collecting signals on the patient's current location, acquires location statistics and computes the movement speed and a number of laps completed when a patient performs running track exercises.

The information is displayed on large screens for the patient's convenience. The overall design of the system allows for virtually unattended exercise. In addition, the information panels are easily distinguishable from each other by their graphical elements and contrast ratios which are common with those on the bracelets. These changes provide better visualization and recognition by the patients.



SERVING COMMUNITY

SCULPTURE REPAIR IN THE WINDSOR SCULPTURE PARK

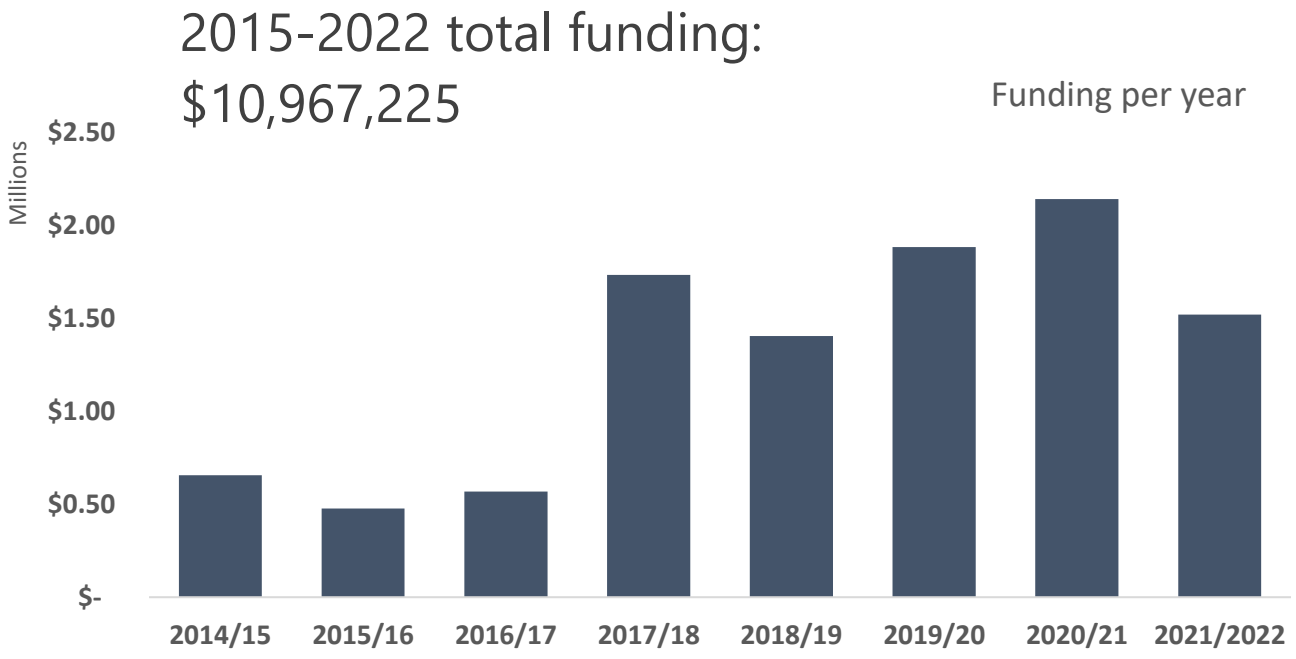
IDIR together with its spin-off OnTech have done sculpture repair works in the Windsor Sculpture Park (also known as the Odette Sculpture Park), using the developed proprietary cold spray process. The Sculpture Park shows 35 large-scale contemporary sculptures by world-renowned artists, including Joe Rosenthal's Consolation. The damaged sculpture Consolation was repaired by IDIR. The implemented by IDIR sculpture repair work was accepted and approved by the Windsor collections assistant Salina Larocque, Education and Public Programs Coordinator.

March 29, 2019: Consolation sculpture (a) with damages and (b) after repair.

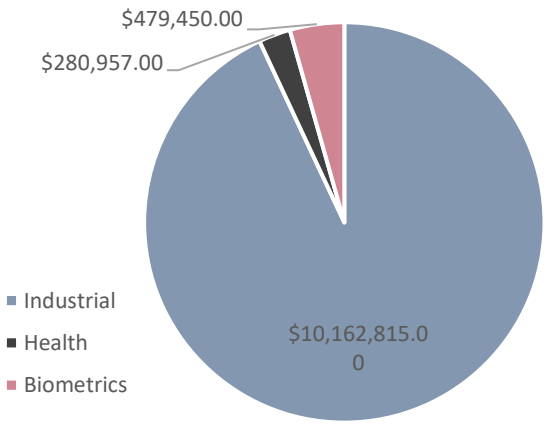
The complete list of Research Projects is in Appendix B on page 26. The complete list of publications and conference presentations is in Appendix C on page 34.

RESEARCH FUNDING

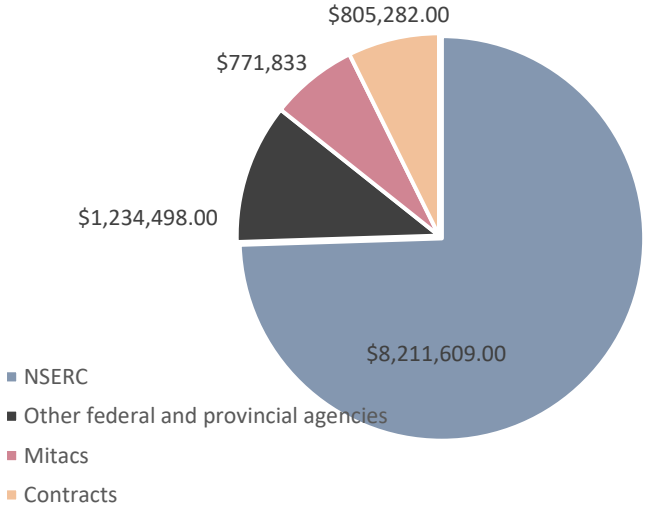
The complete list of Research Grants and Contracts is in Appendix D on page 50.



Funding per year



Funds distribution per research direction



Source of funds

APPENDIX A
STUDENTS' THESES DEFENDED

Year	Name	Title	Degree
2022-present	Anita Gregorian	Analysis of the development of fatigue damage in Inconel components produced by additive manufacturing using non-destructive testing techniques	PhD
2022-present	Rajath Bharadwaj	TBD	MSc
January 2023	Dmitri Shinas	TBD	PhD
2021-present	Vlad Tusinean	Real-time In-process Ultrasonic M-scan Segmentation Using Deep Learning for Adaptive Resistance Spot Welding	MSc
2020-2022	Dmitri Shinas	Development of Image Stitching Algoritm to Improve Characterization of Laser Braze Structure with Ultrasonic NDT	MSc
2020	Ali Abu Hassan	Problems of solving the wire-free communications in industrial environment	MSc- withdrew
2019-present	Jeff Canape	An Investigation of Intermetallic Thermal Barrier Coatings in Internal Combustion Engine Applications	MSc
2019-2021	Sarah Youssef	The novel wideband with low signal/noise ratio transducer be able to realize the multifrequency mode of high resolution acoustical images	PhD
2019-present	Danilo Stocco	Development of a new adaptive spot weld controller driven by an ultrasonic monitoring system.	PhD
2019-2022	Maryam Shafiei Alavijh	Ultrasound methodology development for the nondestructive quality assessment of joints in polyethylene pipes supported by customized deep learning models	PhD
2018-present	Milos Draskovic	Post processing of ultrasonic phased array data for the real time inspection of the resistance spot weld process	MSc
2015-2020	Bartosz Slak	A Novel DualFrequency Ultrasonic Transducer and System for Qualitative and Quantitative Measurements in Dentistry	PhD
2014-2022	Michael Lee	Mathematical Models for Image Processing of Nonlinear Images	PhD
2015-2020	Andrew Ouellette	Ultrasonic Real-Time 2D Imaging of Spot Weld Process	PhD
2015-2019	Bryan St. Amour	Automated Reasoning For Monitoring and Control of Embedded Health Devices	PhD - withdrew
2017-2019	Thiago Toledo Souza	Heart Rate Estimation During Physical Exercise Using Wrist Type PPG Sensors	MSc
2019	Greg Schreiner	In-vivo Characterization of Human Skin Using a Portable Acoustic Microscope	BSc
2019	Naila Rahman	High-Resolution Acoustic Imaging	BSc

		of Benign Nevi and Malignant Melanoma	
2018	Diego Diaz Guerrero	Diagnostic Ultrasound in the Measurement of Cortical Bone Thickness in Porcine Mandibular Specimens", The University of Western Ontario Graduate Program in Orthodontics	Master of Clinical Dentistry
2017-2019	Zareen Reza	Real-time Automated Weld Quality Analysis from Ultrasonic B-scan using Deep Learning	MSc
2015-2018	Sarah Youssef	Methodology for Acoustic Visualization of cellular Structure of Biological Tissues	MSc
2014-2018	Ahmed Elseddawy	Developing an Ultrasound Monitoring System for Nano-biocomposites Thermomechanical Properties	PhD
2015-2017	Rares Anthony Vacarescu	Investigating the Correlation between Chemotherapy and the Ultrasonic Properties of Human Fingernails	MSc
2016-2017	Francia Duaz	Development of a Prototype Device for Sleep Correction Using Electrical Stimulation	MSc
2016-2017	Eric Matthews	Enhanced Landmark Scheme for Two-dimensional Locating of Radiofrequency Identification Tags	MSc
2015-2017	Mariam Al-Ansary	Development of a Post-Processing Algorithm for Accurate Human Skull Profile Extraction via Ultrasonic Phased Array	MSc
2014-2016	Lakhbir Singh	Research and Development of an Advanced RFID Security System Based on Locating Multiple Tags	MSc
2010-2016	Mehdi Hajian	Reconstruction and Analysis of Ultrasound Images for Transcranial Ultrasound Applications	PhD
2013-2015	Andrew Ouellette	Ultrasonic Real-Time 2D Imaging of Spot Weld Process	MSc
2012-2015	Justin Kamp	Development of Portable Small Animal Ultrasonic Tomography System	MSc

APPENDIX B

RESEARCH PROJECTS

University of Windsor Strategic Priorities:

Automotive Research and Innovation
Advanced Materials
Cross Border Strategies
Culture and Social Change
Environment and Ecosystems
Health and Wellness

INDUSTRIAL

Project years, alignment with UofW strategic priority	Project summary, Partners, HQP trained and # of publications
2013-2016 Automotive Research and Innovation; Advanced Materials	"Microfibre-based innovative structural auto parts" ISTP Canada project with University of Toronto and Ford Motor Co - J. Tjong (PI), R. Maev (Co-applicant)., M. Sain (Co-applicant) This Project involves developing biofiber-reinforced composite materials that can be used in the automotive industry to improve vehicle energy efficiency, increase design freedom, and save production cost. IDIR has performed the mechanical properties characterization. **HQP and publications:** 2 HQP trained 3 conference proceedings
2013-2018 Automotive Research and Innovation Advanced Materials	Design and Manufacturing of Direct Micro- and Long-Fibre Lightweight Composites, NSERC APC program with University of Toronto and Ford Motor Co - M. Sain (PI), R. Maev (Co-applicant) The Project involves research and development of ultrasonic nondestructive methods to assess the quality of the newly developed biocomposite materials and further evaluate the long-term quality and sustainability of the materials and mechanical performance of the autoparts. The goal is the assist the automotive manufacturer (Ford Motor Co) in developing high-performance "green" materials by setting the quality control criteria and methods. **HQP and publications:** 12 HQP trained 1 book chapter, 2 conference proceedings 10 conferences and workshop presentations
2014-2016 Automotive Research and Innovation	Examination of Properties of Al Skin Panel Repair Coatings Formed by Cold Spray Process, collaboration with Ford Motor Company - R. Maev (PI) The new Double Flow Supersonic Material Deposition (DFCS) method ensures precise local restoration of damaged areas at near ambient temperature due to the dual flow of propellant and cooling gas. **HQP and publications:** 3 HQP trained
2014-2016 Advanced Materials	Development and Application of the Low Critical Velocity Cold Spray Process, NSERC CRD project with EnWin Utilities – R. Maev (PI) The project aims to study parameters of the DFCS process, the structure and properties of CS coatings formed by the designed powder compositions intended for specific EnWin Utilities applications.

	HQP and publications: 6 HQP trained 1 book, 1 peer-reviewed journal publication, 2 conference papers
2015-2020 Advanced Materials; Culture and Social Change	Novel Cold Spray (CS) tool for repair and maintenance of the City of Windsor Public Art Collection, collaboration with the City of Windsor - R. Maev (PI). The developed CS technology restores following sculpture defects: i) Cracks and pores of casting; ii) Corrosion marks of steel armature which is inside casting; iii) Damage areas due to possible water collection inside the sculpture and its further leakage through the pores of casting; iv) Areas of the previous repair; v) Areas of the thin walls of casting.
2015-2021 Automotive Research and Innovation	Project Northern Star was established to allow for the investigation of nondestructive testing techniques for emerging joining technologies at Ford Motor Company. After promising initial results, Project was extended through Feb 2021 for the development of a novel laser braze inspection system. Contract with Ford Motor Company US – R. Maev (PI). **HQP and publications:** 3 HQP trained 3 conference presentations, 1 proceedings paper, 1 patent application in process
2015-2016 Advanced Materials	Rapid Repair for fuselage damage using Cold Spray, NSERC Engage grant with Bombardier Aerospace – R. Maev (PI). DFCS is developed as a novel maintenance tool for rapid repair of aircraft skin damage on business aircraft. The main feature of the DFCS technology is the formation of dense powder coating layers at near-ambient temperatures, using a stream of accelerated particles directed towards the substrate. Bonding between particles and substrate occurs without particle melting. **HQP and publications:** 2 HQP trained
2016-2018 Advanced Materials	Enhanced corrosion protection behaviour of Aluminum Alloy by discharged plasma electrolytic oxidation. Collaboration with Dr. Aleksey Yerokhin, University of Manchester The project result is new regimes of discharged plasma electrolytic oxidation process and determination of an influence of infiltration/doping by corrosion inhibitors to PEO coatings onto of 6XXX series of aluminum alloy through its electrochemical and accelerated corrosion tests and comparison to existing Dajcor anodizing process. **HQP and publications:** 1 journal article
2016 Automotive Research and Innovation	Proof of concept: Real-Time Integrated Weld Analyzer in Aluminum Spot Welds. Mitacs Accelerate with Alcoa – R. Maev (PI). The Project aims to analyze commercially available aluminum alloys and create a database of information relating welding parameters to weld quality. Determined welding lobes for each aluminum alloy provided by Alcoa. Calibrated RIWA system for each alloy. Improved algorithm for signal processing for automatic recognition of the metal stack boundaries. **HQP and publications:** 1 HQP trained 2 conference proceedings
2016 Advanced Materials	DFSCS process application to repair electrical equipment. Contract with Enersource – R. Maev (PI). Set of transformers and switch units repaired by DFCS and results of assets durability tests.

2016-2018 Advanced Materials; Culture and Social Change	Application of New Metal Deposition Technology for In-field Restoration of Bronze, Zinc, Lead and Cast-Iron Art Works, with True Image Solutions Co, UK – R. Maev (PI). The new CS technology route steps are elaborated and tried: General cleaning, corrosion damage restoration, crack, wear and fracture restoration, build up of missed elements, in-field coating, frame damage repair, patination processes. 
2016-2017 Advanced Materials	IDIR Commercialization Plan. MRIS Strategic Sector Support Funding – R. Maev (PI). Dual-Flow Supersonic Cold Spray Dual-Flow Supersonic Cold Spray-based 3D printing method was developed along with a powder feeder system comprising a cartridge. Based on these results, the prototype system for 3D printing application and powder feeder system were built. Provisional patents granted for both technologies. Based on the strength of prototype testing and provisional patents, full patent applications are prepared for both the 3D printing application and powder feeder system **HQP and publications:** 4 HQP trained 2 journal articles, 2 conference proceedings, 2 patent applications
2017-2018 Automotive Research and Innovation	Low Pressure Cold Spray Technology-based Repair Process for Damaged Automotive Aluminum Alloys Panels. Mitacs Accelerate with Tessonics Corp – A. Sobiesiak (PI). Implementation of a concurrent heat treatment and direct nitriding of feedstock Al6022 powders to reduce the natural oxide layer on Al alloy particles and thus increase the adhesion properties of the LPCS-formed repair coating/patches on damaged automotive panels. The proposed repair technology is highly efficient and completely compatible with automotive panel surface grinding/polishing and painting processes used in the industry. The project results have the potential to benefit automotive companies by offering a new aluminum body repair technology to the thousands of automotive body repair shops. **HQP and publications:** 5 HQP trained 1 book chapter, 3 conference proceedings, 1 patent application
2018-2023 Automotive Research and Innovation; Advanced Materials	Cluster: Novel Quantitative Non-destructive Quality Evaluation of Advanced Joining and Consolidation Manufacturing. NSERC CRD with Narmco Group, Enwin Energy, Bombardier Aerospace and Ford Motor Canada – R. Maev (PI), A. Sobiesiak (Co-applicant), E. Maeva (Co-applicant). Direction 1 of this Project involves the development of high-speed high-resolution ultrasonic monitoring devices, along with the research and development of deep learning approaches applied to automated ultrasonic data interpretation for real-time weld characterization through collaboration primarily with NARMCO. The goal is to develop an ultrasound- and AI-based system for real-time automated characterization of 100% of resistance spot welds in an automotive manufacturing line. This creates grounds for implementation of Industry4.0 and NDE4.0 concepts of smart factory. **HQP and publications:** 8 HQP trained 1 journal article, 3 conference proceedings
	Direction 2 of this Project involves the development, characterization and validation of Conductive Copper Coatings. Specific applications of the DFCS process focus on resolving EnWin Utilities electrical utilities and water supply system maintenance issues: • Maintenance/repair of highly conductive coatings for surface modification of electric connectors and clamps;

	• Corrosion protection/leak repair coatings of power distribution transformer casings and water management system components (e.g. pipe welded joints, pipe leaks, etc.). **HQP and publications:** 3 HQP trained 2 journal article, 5 conference proceedings
	Direction 3 involves the development, characterization and validation of corrosion- and wear-resistant composite coatings. The proposed innovative research will introduce significant cost savings to the problem of fuselage and leading edge skin repair. Bombardier will be the first company to realize these cost savings. The successful implementation of the Project will create new business opportunities for Bombardier. **HQP and publications:** 3 HQP trained 2 journal article, 3 conference proceedings
	Direction 4 involves the Development, Characterization and Validation of MIL-based multilayer Thermal Barrier Coatings The main objective of the Project is the development of LPCS-deposited TBC intermetallic coatings and their validation them at the diesel engines. New multilayer intermetallic based coatings are made and examined in various conditions. **HQP and publications:** 3 HQP trained 3 journal articles, 7 conference presentations
2020-2023 Automotive Research and Innovation	Thermal Sprayed Battery Cell Terminal Electrical Interconnection. NSERC CRD with Ford Motor Co – R. Maev (PI). The overall goal of the Project is to develop RSW-based and Cold Spray processes for forming electrical interconnection interface, which is free of intermetallic compounds, and has low contact resistance between battery electrodes & bus bar. The developed process should also allow for fabrication of scalable battery cell–to–module systems **HQP and publications:** 2 HQP trained 1 conference proceeding
2020 Advanced Materials	New Powder Technologies Development for Advanced Applications. Mitacs Globallink project – R. Maev (PI), A. Elseddawy (PDF Globalink Intern). New powder metallurgy, Spark Plasma Sintering, Aerosol Cold Spraying and other nonconventional sintering processes for advanced nano-composites synthesis **HQP and publications:** 1 HQP trained 2 journal articles
2020-2022 Environment and Ecosystems	Methodology development and implementation of a platform for nondestructive evaluation of both butt-fused and electrofused polyethylene pipe joints using ultrasound and deep learning. Mitacs Accelerate with Jana Corporation – R. Maev (PI). This Project is a continuation of our earlier MITACS project with InDepth (subsidiary of Jana) due to our success in the initial Project. We are expanding our approach of applying deep learning to ultrasound data on electrofused polyethylene pipe joints. The goal of this Project is to develop similar methodology for ultrasound-based inspection supported by

	deep learning for electrofusion joints. The ultimate aim is integration of butt-fusion and electrofusion inspection systems into a single inspection unit. **HQP and publications:** 5 HQP trained 3 journal articles, 2 conference proceedings
2021-2024 Automotive Research and Innovation	Development of a new adaptive spot weld controller driven by an ultrasonic monitoring system. NSERC Alliance application with NADEX and CEL – R. Maev (PI), R. Gras (Co-applicant). This Project involves the research and development of deep learning approaches for automated assessment of real-time ultrasonic time-series data, in which the outputs of models are used for real-time feedback to the weld controller for weld process regulation. The goal of this Project is to develop a system which monitors in real time the welding process, producing actionable feedback directly to the weld controller to regulate and refine the resistance spot welding process as it unfolds. The ultimate goal is towards zero-defect resistance spot welding. **HQP and publications:** 4 HQP to be trained
2022-2023 Automotive Research and Innovation Advanced Materials	Advanced Cold Spray Additive Manufacturing Facility, Canada Foundation for Innovation Large Infrastructure Fund - S. Yue (PI) McGill University, R. Maev (Co-applicant). The main objective of the CFI project is to develop a hybrid manufacturing facility, centred on cold spray, making possible the fabrication of net-shaped 3D components on parts with proper dimensions and material properties. The following institutions are involved in the project: McGill University (Montreal, Quebec), Transportation and Advanced Manufacturing division, NRC (Boucherville, Quebec), Concordia University (Montreal, Quebec), and University of Windsor (Windsor, ON). The roles of the project participants are as follows: McGill-assembling a High Pressure Cold Spray-based additive manufacturing simulator cell, NRC- assembling a Powder Tailoring Facility and development of Digital Twin of Hybrid Manufacturing Cell, Concordia- assembling a Liquid Cold Spray-based additive manufacturing simulator cell, University of Windsor-assembling a Low-Pressure Cold Spray-based additive manufacturing simulator cell.

B I O M E D I C A L

2014-2016 Health and Wellness	Collaboration with Karmanos Cancer Institute (KCI), Wayne State University (WSU), Detroit, MI International Imaging Center (IIC) between KCI and University of Windsor Since 2012 Imaging Center director: Dr. Neb Duric (KCI); Co-director: Dr. Roman Maev (IDIR) Mission: to stimulate cross-border research in clinical imaging – Jointly develop new clinical imaging techniques – Apply techniques from other disciplines to clinical research. – Technology transfer that would foster economic activities on both sides of the border Active projects since 2015: – High-frequency ultrasound imaging for dermatology applications; – Tissue histology project: Distinguishing Cancer from normal breast tissues by acoustic microscopy – Application of Ultrasound Tomography for diagnosis of brain tumors; – Design and development of an ultrasonic system for Small Animal Imaging All ICC projects are focused on medical applications of ultrasound technology **HQP and publications:** 2 HQP trained

	2 oral presentation, 1 poster presentation, 1 technical report, 7 journal articles
2017-2019	Collaboration with Hotel Dieu Grace Hospital –*RFID Monitoring System* – IDIR works with the Hotel-Dieu Grace Healthcare (HDGH) developing and installing an automated system for attendance to patients performing running track exercises. The system is based on a constellation of Radio-Frequency Identification (RFID) antennas and radio transmitters embedded into wearable bracelet-type devices, which keeps collecting signals on the current location of the patient, acquire location statistics, computes the speed of movement and number of laps completed when a patient performs running track exercises. **HQP and publications:** 2 HQP trained
2015-2016 Health and Wellness	Influence of Human Factor on the Variability of the Output of the Percussion Device for Pulmonary Diagnostics, with George Brown College – R. Maev (PI) This study is conducted as a necessary preliminary step, before a clinical study of the device on human subjects. The purpose of the study was to investigate the variability of the output signals of the Pd in controlled conditions and on invariable phantoms. The goal is to determine the variability due to human factors related to the operator of the device and the effects of this variability on the accuracy of the correct identification of the specific area on the phantom. **HQP and publications:** 1 conference presentation
2015-2018 Health and Wellness	Hospital for Sick Children (SickKids), Head of Neurosurgery, Dr. James Drake, and his team at the Centre for Image Guided Innovation and Therapeutic Intervention (CIGITI), Toronto, ON – R. Maev (Co-PI), J. Drake (Co-PI). The objective of the collaboration with SickKids Hospital was to test and evaluate our portable trans-skull ultrasonic imaging system for diagnosis of certain types of traumatic brain injuries (TBI) and abnormalities in adults, children and neonates. The targeted brain injuries and abnormalities in this collaborative Project include intracranial hemorrhage in adults and children and intraventricular hemorrhage (IVH) in neonates, embolism, presence of foreign objects in the brain tissue, aneurysms and stenosis. We designed and manufactured Dual-Mode High Intensity Focused Ultrasound (HIFU) experiments with our partners at SickKids. The preliminary results on bovine serum albumin (BSA) gel phantoms showed successful performance of the prototype to precisely steer and focus high intensity ultrasound in a confined focal volume of about 1mmx1mmx3mm, while simultaneously providing a beamformed sonogram of the sonicated area. **HQP and publications:** 2 HQP trained 3 journal articles, 2 conference presentations
2016-2017 Health and Wellness	IDIR Commercialization Plan. MRIS Strategic Sector Support Funding. Brain Scanner – R. Maev (PI) As a result, the 16x16 element array transducer was incorporated into Alpha Prototype of the Brain Scanner and the portable Alpha Prototype version of the Brain Scanner was designed and built. **HQP and publications:** 1 HQP trained

2017-2019 Health and Wellness	Lawson Health Research Institute, London, ON, Schulich School of Medicine and Dentistry\Epidemiology & Biostatistics, London, ON, Victoria Hospital, London, ON The objective of this project is to evaluate a novel point-of-care percussion device (PD) for detection of pneumothorax in patients following thoracic surgery. The device is a fully functional basic platform that can perform both vibrational and impact percussion and analyze signals coming from embedded and standalone contact sensors that are insensitive to ambient noise. Our vision is that it will be a user-friendly device for rapid pulmonary screening at point of examination or initial care without involvement of highly educated medical personnel. **HQP and publications:** 2 HQP trained 2 conference proceedings, 1 invited talk
2018-2020 Health and Wellness	Feasibility assessment of dental root detection through alveolar bone in porcine mandibles and jaw phantoms. Collaboration and internal UWO funding with Dr. Ali Tassi, Department of Dentistry, the University of Western Ontario, London, ON and Diego Diaz B.Sc., DDS Graduate Orthodontics Resident. **HQP and publications:** 2 HQP trained 1 journal article
2015-ongoing Health and Wellness	High-resolution acoustic microscopy for biological applications. Toyohashi Institute of Technology – Dr. N Hozumi, Dr. S. Yoshida Windsor's Hotel Dieu Grace Hospital, Penn State University, and Karmanos Cancer Institute. High-frequency ultrasound microscopy is well recognized as an effective tool for visualizing with high resolution (1-10 microns) the acoustical properties of objects that are closely correlated with biomechanical properties of the excised tissues or cultured cells as well as elastic properties of various inorganic materials. We have demonstrated a good correlation of ultrasonic images with stained histopathology which is a gold standard. A new method for rapid and accurate determination of margins between pathological and healthy tissue was developed. A portable ultrasonic skin imager has been designed and built. Such acoustic unit was developed for a 100 MHz frequency range. **HQP and publications:** 12 HQP trained 2 journal articles, 5 conference proceedings, 11 conference presentations

BIOMETRICS

2016-2017 Cross Border Strategies	IDIR Commercialization Plan. MRIS Strategic Sector Support Funding. 3D Fingerprint Biometric Security – R. Maev (PI) Develop a high-speed electronic finger pad scanner for the ultrasonic 3D Fingerprint system. Build a portable Beta Prototype version of the ultrasonic 3D Fingerprint system The new version of ultrasonic scanner has essentially improved performance: shorter scanning time and more stable output signal. The data acquisition electronics combined with scanner and the whole unit can be reproduced in low volume production. Software package includes embedded programs for build-in controller, matching algorithm and interface shell providing general control over device. The updated and improved signal and image processing algorithms gives clearer and more reliable fingerprint image as well as faster and more precise matching against data stored in databases. **HQP and publications:** 2 presentations, 2 publications in a Special Issue of the Journal "INSIGNT"

2018-2019 Cross Border Strategies	Enhanced Biometrics System with Object Detection for Airport Airside Access. NSERC Engage with Greater Sudbury Airport and Consortium for Aerospace Research Innovation in Canada (CARIC) – R. Maev (PI) The Project includes research and development of advanced methods for biometrics identification. The goal was to develop and build prototype of access system for secured areas in airport based on combined use of personal access card, fingerprint reading and face recognition algorithm. **HQP and publications:** 1 HQP trained

APPENDIX C
PUBLICATIONS, PRESENTATIONS, COMMITTEES

BOOKS, BOOK CHAPTERS, EDITORIAL WORK

1. Maev, R., Chertov, A., Scott, R., Stocco, D., Ouellette, A., Denisov, A., Oberdoerfer, Y. "NDE in The Automotive Sector" In: Handbook of Nondestructive Evaluation 4.0, (Ed.) Meyendorf N., Ida N., Singh R., Vrana J. Springer. 2022 https://doi.org/10.1007/978-3-030-48200-8_21-1
2. Maev. R. Issue Curator, Special Issue, Artwork Analysis, CINDE, 42, No. 1, (2021)
3. Maev. R. Gr., Honorary Technical Editor, Special Issue: NDT 4.0, Research in Non-destructive Evaluation, (2020)
4. Maev. R. Gr., Honorary Editor, Special Feature: NDT in Art & Cultural Heritage, Insight Magazine, 62 (3), 2020
5. Maev. R. Gr., Guest Editor and paper contributor into Special Issue of BINDT Journal "INSIGHT' 2016, 2018, 2020
6. Maev. R. Gr., Leshchynsky. V.,"Low Pressure Cold Spray Applications in Cold-Spray Coatings: Recent Trends and Future perspectives in: Cold-Spray Coatings Recent Trends and Future perspectives, ed. Pasquale Cavaliere, 95-142. Springer, 2017
7. Maev, R. Gr. "Acoustic Microscopy for Materials Characterization", In Materials Characterization Using Nondestructive Evaluation (NDE) Methods, 161-175. Elsevier, Oxford, UK, 2016
8. Maev,R. Gr., Leshchynsky, V., Cold Gas Dynamic Spray, CRC Press/Taylor & Francis Group, USA, 2016
9. Maev, R. Gr., Titov, S., "Nondestructive Evaluation of Cold Spray Coatings," In Cold Gas Dynamic Spray, 231-248. CRC Press/Taylor & Francis Group, USA, 2016
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11. Matteazzi, P., Colella, A., Leshchynsky, V., Sakaki, K., Fukanuma, H., Maev, r. Gr. "Cold Spray Powders and Equipment" In Cold Gas Dynamic Spray, 75-138. CRC Press/Taylor & Francis Group, USA, 2016
12. Maev, R. Gr. Acoustic Microscopy for Materials Characterization, Chapter in "Materials Characterization Using Non-destructive Evaluation (NDE) Methods," 161-175, Elsevier, Oxford, UK, 2016
13. Maev, R. Gr., Leshchynsky, V. (editors and contributors), Cold Gas Dynamic Spray. CRC Press 2015, 340 pages

PEER-REVIEWED JOURNAL ARTICLES

Industrial

1. R.Gr. Maev, F. Seviaryn, Applications of non-linear acoustics for quality control and material characterization, Journal of Applied Science, 2022 (In press)
2. A. Baradarani, A. Chertov, R. Gr. Maev, Blind Vision for Ultrasonic Nondestructive Inspection of Resistance Spot Welds, Elsevier Journal of Expert Systems, 2022 (submitted)

3. M. Lee, P. Habashi, B. Shahrrava, R. Gr. Maev, Enhancing Multi-View 3D-Reconstruction Using Multi-Frame Super Resolution" for possible publication in Machine Vision and Applications, Machine Vision, and Applications, 2022 (submitted)
4. M. Lee, Maeva, E., V. Leschynsky, and Maev, R. Gr., A Novel processing technique for Al6022 stock powder for Cold Spray Applications, Journal of Material Processing Technology, submitted, 2021
5. M. Shafiei Alavijeh, R. Scott, F. Seviaryn, R. Gr. Maev, Application of chord transducer for ultrasonic detection and characterization of defects in MDPE butt fusion joints. Insight, 2022. (In press)
6. V. Leshchynsky, J. Leśniewicz, G. Kubicki, J. Sulej-Chojnacka, R.Gr. Maev, Aerosol Cold Spraying Technology for metal and ceramic coatings deposition, Journal of Thermal Spray Technology, 2022 (In press)
7. Maev, R.G.; Tjong, J.; Leshchinsky, E.; Pantea, M.; Leshchynsky, V. Cold-Sprayed Multilayer Thermal Barrier–Catalytic Coatings for Engine Pistons: Coatings Design and Properties, Coatings 2022, 12, 1332. https://doi.org/10.3390/ coatings12091332
8. Kubicki, G.; Leshchynsky, V.; Elseddawy, A.; Wisniewska, M.; Maev, R.G.; Jakubowicz, J.; Sulej-Chojnacka, J. Microstructure and Properties of Hydroxyapatite Coatings Made by Aerosol Cold Spraying–Sintering Technology, Coatings 2022, 12, 535. https:// doi.org/10.3390/ coatings12040535
9. M. Shafiei Alavijeh, R. Scott, F. Seviaryn, R. Maev, Using machine learning to automate ultrasound-based classification of butt-fused joints in medium density polyethylene gas pipes, The Journal of the Acoustical Society of America, Vol. 150, 561-572, 2021. https://doi.org/10.1121/10.0005656)
10. Leshchynsky V., Maev R. Gr. et al. Development and characterization of novel WC-Ti cemented carbides obtained by FAST/SPS, Archives of metallurgy and materials, 2021 accepted
11. Leshchynsky V., Elseddawy A., Maev R. et al. Microstructure and mechanical properties of Hydroxyapatite coatings made by Hybrid Aerosol Spraying, Journal of Sintering Technology, 2021, submitted
12. Maev,R. Gr., Tjong, J., Leshchynsky, V., Pantea , M. and Strumban, E. Cold Sprayed Intermetallic Based Multilayer Thermal Barrier Coatings For Engine Pistons, submitted, 2021
13. Alavijeh, M. S., Scott R., Seviaryn, F., Maev, R. Gr. Using machine learning to automate ultrasound-based classification of butt-fused joints in medium density polyethylene gas pipes, *Journal of the Acoustical Society of America* –in print
14. Alavijeh, M. S., Scott, R., Seviaryn, F., Maev, R. Gr. NDE 4.0 compatible ultrasound inspection of butt-fused joints of medium-density polyethylene gas pipes, using chord-type transducers supported by customized deep learning models, *Research in Nondestructive Evaluation*, 31, no 5-6, (2020), 290-305, DOI: 10.1080/09349847.2020.1841864
15. Garbiec, D., Leshchynsky, V., Colella, A., Matteazzi, P. Structure and Deformation Behavior of Ti-SiC Composites Made by Mechanical Alloying and Spark Plasma Sintering*, Materials*, 12, no 8, (2019), 1276
16. Leshchinsky, E., Sobiesiak, A., Maev, R. Intermetallic Al-, Fe-, Co- and Ni-based Thermal Barrier Coatngs Prepared by Cold Spray for Applications in Low Heat Rejection Diesel Engines, *Journal of Thermal Spray Technology*, 27 (2018), 456-470
17. Leshchynsky, V. et al. , Friction and wear of the intervertebral disc endoprosthesis manufactured with use of selective laser melting process, *Rapid Prototyping Journal*, 23, no 6. (2017), 1032-1042
18. Titov, S., Maev, R. Gr., Bogachenko, A. N. Lens Multielement Acoustic Microscope in the Mode for Measuring the Parameters of Layered Objects, *Acoustical Physics*, 63, no 5, (2017), 583-589
19. Maev, R. Gr., Leshchynsky, V., Strumban, E., Dzhurinskiy, D., Kocimski, J., Maeva, E. Structure and Mechanical Properties of Thick Copper Coating Made by Cold Spray, *Journal of Thermal Spray Technology*, 25, no 1 (2015), 113-122

20. Dzhurinskiy, D., Leshchynsky, V., Strumban, E., Maev, R. Gr. Protective Coatings for Mechanical Joints of Magnesium Components, *Surface Engineering,* 31, no 10 (2015), 740-746 DOI: 10.1179/1743294415Y.0000000036
21. Dzhurinskiy, D., Erokhin, A., Strumban, E., Leshchynsky, V., Maev, R. Gr. Characterization of Plasma Electrolitic Oxidation formed TiO2: nano-HA coatings on Titanuim (Grade 5) Alloy substrate and their Corrosion Behavior in Simulated Body Fluid, *Surface and Coating Technology,* 269, no 1 (2015), 258-265
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24. Ghaffari, B., Dekam, J., Haddix, K., Lazarz, K., Titov, S., Maev, R. Gr. Nondestructive Evaluation of Adhesively-Joined Aluminum Alloy Sheets Using an Ultrasonic Array, *SAE Technical Paper* 2015-01-0702, 2015

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1. J. Pattem, M. Davrandi, S. Aguayo, B. Slak, R. Maev, E. Allan2, D. Spratt2 and L. Bozec, Dependency of hydration and growth conditions on the mechanical properties of oral biofilms, Nature Scientific Reports 11, 16234, 2021. https://doi.org/10.1038/s41598-021-95701-4
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4. Rahayu, R. H., Takanashi, K., Kwong Soon, T. T., Seviaryna, I., Maev, R., Kobayashi, K., Hozumi, N., Yoshida, N. Reaction assessment of cultured breast cancer cells exposed to anticancer agents using microscale acoustic impedance profile, *Japanese Journal of Applied Physics*, 57, 07LF26 (2018)
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12. Shapoori, K., Sadler, J., Wydra, A., Malyarenko, E., Sinclair, A., Maev, R. Gr., "Ultrasonic Adaptive Beamforming through Randomly Shaped Scattering Layers and its Application to Transcranial

Imaging; Part I: Transmission Mode", *IEEE Transactions on Biomedical Engineering (TBME)*, 62, no 5 (2015), 1253-1264
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14. Wydra, A., Chertov, A., Maev, R. Gr., C. Kube, Du, J. Turner, Grain Size Measurement of Copper Spot Welding Caps Via Ultrasonic Attenuation and Scattering Experiments, *Research in Nondestructive Evaluation*, 26, no 4, (2015), 225-243
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Art

1. Maev, R., Baradarani, A., Taylor, J.R.B. Artwork Forgery & Crequelure Patterns, *CINDE Journal*, 42, no 1 (2021), 12-15
2. Maev, R Gr., Baradarani, A., and Taylor, J. R. B. New concept for art and antiquities identification based on craquelure pattern analysis, *Insight* , 62 no 3 (2020) , 134-138
3. Gavrilov, D., Maev, R. Gr. Extraction of Independent Structural Images for Principal Component Thermography, *Applied Sciences*, 8, no3 (2018), 459
4. Thickett, D., Cheung, C. S., Liang, H., Twydle, J., Maev, R. Gr., and Gavrilov, D. Using non-invasive non-destructive techniques to monitor cultural heritage objects, *Insight,* 59, No 5 (2017), 1-5
5. Twydle, J., Gavrilov, D, Thickett, D., and Maev, R. Gr. Mobile art analysis: evolution of the concept and new perspectives, *Insight,* 59, No 5 (2017), 235-242
6. Maev, R.Gr., Honorary Editor, Special Feature: NDT in Art & Cultural Heritage, *Insight Magazine*, 59 (5), 2017

CONFERENCE PRESENTATIONS

Industrial

1. Maev R Gr, Leshchynsky V, Robert B, Brackett T P, Strumban E, Tab-to-busbar interconnects formed by Dual Flow Cold Spraying, International Thermal Spray Conference – ITSC, 2023
2. Scott R., Stocco D., Chertov A., Maev R.Gr., Automated and real-time interpretation of ultrasonic B-scans toward Industry/NDE 4.0, IEEE Ultrasonics Symposium, October 10-13, 2022
3. R. Gr. Maev, A.M. Chertov, D. Stocco, M. Rodzik, J. Chamberlain, NDE 4.0 in Body-in-White Vehicle Assembly Process, NDT in Canada 2022 – May 17-19, 2022, Windsor ON.
4. A. Ouellette, D. Shinas, B. Ghaffari, E. Hetrick, R. Gr. Maev, Adaptive Ultrasound Imaging Applied to Laser Brazed Joints, IEEE Int. Conf. on Ultrasonics (IUS22), Venice, Italy, Oct. 2022
5. A. Baradarani, K. Shapoori, E. Malayrenko, J. Sadler, J. Gelovani, R. Gr. Maev, Detection of Hematoma Boundaries in Transcranial Ultrasound Brain Imaging via Envelope Reconstruction on Resonance-Based Signal Decomposition, IEEE Int. Conf. Ultrasonics (IUS22), Venice, Italy, Oct. 2022
6. A. Baradarani, A. Denisov, R. Gr. Maev, Accurate Location of Key Features in Ultrasonic-Based Spot Weld Inspection, IEEE Int. Conf. on Ultrasonics (IUS22), Venice, Italy, Oct. 2022
7. R. Scott, D. Stocco, A. Chertov, R. Gr. Maev, Using Deep Learning to Characterize Ultrasonic B-scans, ASNT Conference Proceedings, 2022, 30th ASNT Research Symposium, June 20-23, 2022
8. V. Leshchynsky, Gg. Kubicki, J. Chojnacka, A. Eleseddawy, R. Gr. Maev, Aerosol Cold Spray Technology for Ceramic and Metal Coating Deposition, International Thermal Spray Conference, Vein, Austria, 2022
9. Scott R., Stocco D., Chertov A., Maev R.Gr., Deep Learning for Real-Time Quality Characterization of Ultrasonic B-scans from Resistance Spot Welds. CINDE NDT in Canada Conference, May 17-19, 2022

10. A. Ouellette, M. Draskovic, A. Chertov, R. Gr. Maev, In Process Monitoring of Resistance Spot Welding Using Ultrasound Phased Array. CINDE NDT in Canada Conference, May 17-19, 2022
11. M. Alavijeh, F. Seviaryn, R. Scott, R. Gr. Maev, Automated Ultrasound Evaluation Using Chord Transducer for Polyethylene Butt Fusion Joint. CINDE NDT in Canada Conference, May 17-19, 2022
12. Tusinean V, Scott R., Stocco D., Chertov A., Maev R.Gr., Real-Time Interface Characterization in Ultrasonic Images of Resistance Spot Welds Using Deep Learning. CINDE NDT in Canada Conference, May 17-19, 2022
13. Maev, R. Gr., Advances in Modern Mass-Manufacturing using NDE 4.0 Process based on Artificial Intelligence, International Virtual Conference on NDE 4.0, Germany, April 14-15 and 20-21, 2021.
14. Maev, R. Gr., Leshchynsky, V., Strumban, E., Elseddawy, A., Chojnacka, J., Garbiec, D. Aerosol Cold Spray and Sintering of Hydroxyapatite Coatings, Materials Science & Technology, 2020 MS&T20 (virtual conference), November 2-6, 2020
15. Maev, R. Gr., Leshchynsky, V., Strumban, E., Forming Al tab to Cu busbar joints using Low Pressure Cold Spray Process, Materials Science & Technology2020 MS&T20 (virtual), November 2-6, 2020
16. Maev, R., Leshchynsky, V., Strumban, E., Wladarski, J. The use of low-pressure cold spray-formed Cu–Al2O3 MMC coatings to improve the surface properties of the electrical connectors, 2nd Coatings and Interfaces Web Conference, May 15-31, 2020
17. Ouellette, A., Shinas, D., Ghaffari, B., Hetrick, E., Maev, R. Adaptive, Ultrasound Phased-Array Techniques for Imaging of Laser Brazed Joints in the Automotive Sector, ASNT 2020 Research Symposium (Virtual Event)
18. Stocco, D., Chertov, A., Maev, R., Yoo, S., Jung, S. H. Comparison between real time ultrasonic B-scan inspection and dynamic resistance curves obtained from resistance spot welding controllers for automotive applications, ASNT 2020 Research Symposium (Virtual Event)
19. Alavijeh M.S., Scott R., Seviaryn F., Maev R.Gr., Ultrasound flaw detection of medium-density polyethylene fused joints using chord transducers and implementation of artificial intelligence. 2020 IEEE International Ultrasonics Symposium (IUS), Virtual event, September 8-11, 2020
20. Alavijeh M.S., Scott R., Seviaryn F., Maev R.Gr., Inspection of butt fusion joints of medium density polyethylene pipes using pulse-echo ultrasound. International Symposium on Structural Health Monitoring and Nondestructive Testing, Virtual event, November 25-26, 2020
21. Wolf, F., Stocco, D., Koal, J., Mathiszik, C., Chertov, A., Maev, R. Gr., Zschetzsche, J., Füssel, U. Ultrasonic B-Scan inspection for resistance spot welding of thin copper sheets with copper-tungsten electrodes, ASNT 2020 Research Symposium (Virtual Event)
22. Leschynsky, V., Maev, R. GR. et al. Influence of spark plasma sintering (SPS) process parameters on selected structure and properties of MAX phase and Ti3SiC2-based composite, III Polish National Workshop on Spark Plasma Sintering, October 23, 2020
23. Leshchynsky, V., Maev, R Gr. et al. Microstructure and thermal conductivity of the ZrO2-MWCNTs composite obtained by FAST/SPS method, Polish III National Workshop on Spark Plasma Sintering, October 23, 2020
24. Chertov, A., M. Draskovic, Maev, R. Gr., M. Rodzik, and D. Rodzik, Automation of Resistance Spot Weld Inspection with Feedback Capability During Protection. A Case Study., ASNT Research Symposium 2019, Garden Grove, CA, April 1-4, 2019
25. Chertov, A., Reza Z.N., Scott, R., Maev, R.Gr., Rodzik, M., Rodzik, D.Jr. Industrial Implementation of Newly Developed Ultrasonic Inspection System for Resistance Spot Welding. 15th International Symposium on Nondestructive Characterization of Materials, September 17-19, 2019
26. Maev, R. Gr., Chertov, A., S. Jung, and S. Yoo, Ultrasonic Non-Destructive Evaluation for Real Time Regulation of Welding Schedule, ASNT Research Symposium 2019, Garden Grove, CA, 1-4 April, 2019

27. Maev, R., Leshchynsky, V., Strumban, E., Tjong, J., Ramey, B. Low Cost Thermal Barrier Coatings for Diesel Engine Combustion Chamber. Ford Motor Co. Powertrain, Light Weighting, Electrification, Connected & Autonomous Vehicle Workshop, May 30, 2019
28. Maev, R. Dual Flow Cold Spray Prospects and Application. KONTECH Conference Advanced Forming Technologies and Nanostructured Materials, Poland, October 2019
29. Leshchynsky, V., A. Elseddawy et al, Mechanical and biochemical properties of HA/CuNp coatings deposited by Cold Spraying, KONTECH Conference Advanced Forming Technologies and Nanostructured Materials, Poland, October 2019 (poster)
30. Leshchynsky, V., Mechanisms of Structure Formation during Aerosol Spraying, KONTECH Conference Advanced Forming Technologies and Nanostructured Materials, Poland, October 2019
31. Ouellette, A., Titov, S., Ghaffari, B., Hetrick, E., Clarke, J., Maev, R. Adaptive Ultrasonic Imaging for Phased Array Inspection of Laser Brazed Joints. ASNT Research Symposium 2019, Garden Grove, California, April 2, 2019
32. Ouellette, A., Chertov, A., and Maev, R. Gr. 2D Imaging of Resistance Spots Welds of Dissimilar Thickness Material, 27th ASNT Research Symposium 2018, Orlando, FL, March, 26-29, 2018.
33. Maev, R. Gr., V.Leshchynsky, Strumban, E., Dzhurinskiy, D., Low Pressure Cold Spray and Reaction Sintering of Intermetallic Metal Matrix Composite Coatings, Proceedings of International Thermal Spray Conference and Exposition 2018; Orlando, Florida, May 7-10, 2018
34. Maev, R. Gr., Leshchynsky, V., Application of Cold Spray Technology for Thermal Barriers, Corrosion Protection and Casting Repairs, Ford Motor Co. Powertrain, Light Weighting, Electrification, Connected & Autonomous Vehicle Workshop, December 12, 2018
35. Maev, R. Gr., Leshchynsky, V., J. Wladarski, E. Sanin, LDC Asset repair and Cu Conductive Coatings on Aluminum Components, Canadian Utilities Equipment & Engineering Trade Show, Mississauga, Canada, September, 2018
36. Chertov, A., Maev, A., Leshchynsky, V. In-line Ultrasonic Quality Monitoring of Aluminum-Steel Joining Fabricated by Cold Spray & Resistance Spot Welding Processes, 27th Research Symposium, March 26 – 29, 2018
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38. Dzhurinskiy, D. Dual Flow Cold Spraying Cu Conductive Coatings on Aluminum Components, Proceedings of International Thermal Spray Conference and Exposition 2018, Orlando, Florida; Gaylord Palms Resort & Convention Center, May 7-10, 2018
39. Gavrilov, D., Maev, R. Gr., Qualitative Assessment of Structural Damage to Composite Avionic Materials by Acoustic and Thermographic NDE Methods, 27th ASNT Research Symposium 2018, Orlando, FL, March, 26 - 29 2018
40. Reza, Z. N., Chertov, A., Maev, R. Gr., Intelligent Real-time Pattern Analysis on Ultrasonic B-Scans, NSERC Create oNDuTy! Annual General Meeting 2018, Université Laval, Quebec City, June 4-6, 2018
41. Bondy, M., Gavrilov, D., Seviaryna, I., Maev, R. Application of Acoustic and thermographic Methods for Analysis of Impact Damage to Composite Avionic Parts, 14th International Workshop on Advanced Infrared Technology and Applications, Quebec City, Canada., September 27, 2017
42. Maev, R. Gr., Leshchynsky, V., Strumban, E., Dzhurinskiy, D., Maeva, E., Low Pressure Warm Spray of Stainless Steel Coatings. Particle Stratin Localization Process. International Thermal Spraying Conference, Dusseldorf, Germany, Thermal Spray 2017: Proceedings from the International Thermal Spray Conference, 2017, Düsseldorf, Germany, June 7-9, 2017
43. Leshchynsky, V., Maev, R. Gr., Strumban, E., D. Dzhurinsky, Maeva, E., Development of strain gradient plasticity models of cold spray process. International Thermal Spray Conference &

Exposition, Dusseldorf, Germany, Thermal Spray 2017: Proceedings from the International Thermal Spray Conference, 2017, Düsseldorf, Germany, June 7-9, 2017
44. Leshchynsky, V., Maev, R. Gr., Strumban, E., D. Dzhurinsky, Maeva, E., Low pressure cold spray additive manufacturing of molds and dies. International Thermal Spray Conference & Exposition, Dusseldorf, Germany, Thermal Spray 2017: Proceedings from the International Thermal Spray Conference, 2017, Düsseldorf, Germany, June 7-9, 2017
45. Maev, R. Gr., Capacities, functioning, access points, example(s) of collaboration with industrial partner(s). Nanofacilities for Emerging Automotive and Aerospace Technologies: Industry-University Showcase, Waterloo, Ontario, Canada, May 11, 2017
46. Elseddawy, A., Seviaryna, I., Leshynsky, V., Maev, R. Gr. Correlation Method Based Bio-composite Material Temperature Estimation Utilizing Ultrasound Signals, 30th Annual Conference on Electrical and Computer Engineering (CCECE 2017), Windsor, ON, April 30 - May 3, 2017
47. Ouellette, S. Titov, B. Ghaffari, E. Hetrick, Maev, R. Gr., Full Matric Capture for Ultrasonic Imaging through Brazed Surfaces, ASNT 26th Research Symposium, Jacksonville, FL, USA, March 12-17, 2017
48. Regalado, W. P., Chertov, A., Leshchynsky, V., Maev, R. Gr., Advancements in Welding Lightweight Metals to Steel, ASNT 26th Research Symposium, Jacksonville, FL, USA, March 12-17, 2017
49. Maev, R. Gr., A. Ouellette, S. Titov, Ultrasonic NDT of Adhesively Bonded Joints of Curved Surfaces, ASNT 26th Research Symposium, Jacksonville, FL, USA, March 12-17, 2017
50. Lehmann, N., Grabau, M., Maev, R. Gr., Denisov, A. Robotized Ultrasonic Testing of Resistance Spot Welds with Automated Spot Weld Detection in Car Body Construction, ASNT 26th Research Symposium, Jacksonville, FL, USA, March 12-17, 2017
51. Regalado, W. P., Chertov, A., Maev, R. Effect of Thermal Expansion in the Real-Time Ultrasonic Inspection of Aluminum Spot Welds, Sheet Metal Welding Conference XVII, October 19-20 2016.
52. Baradarani, A., Maev, R. Gr., 3D Ultrasonic Signature for Spot Weld Analysis and Inspection, IEEE International Ultrasonics Symposium, Tours, France, September 18-21, 2016. DOI: 10.1109/ULTSYM.2016.7728553
53. Baradarani, A., Denisov, A., Maev, R. Gr., Acoustical Signature for Fused Samples in Spot Weld Analysis, ASNT 25th Research Symposium, New Orleans, LA, USA, April 11-14, 2016
54. Baradarani, A., Chertov, A., Regalado, W. P., Maev, R. Gr., Real-time Ultrasonic Inspection of Resistance Spot Welds in Extremely Noisy Industrial Environments, ASNT 25th Research Symposium, New Orleans, LA, USA, April 11-14, 2016
55. Maev, R. Gr., "Innovation Drives Quality" - New Generation of High Resolution Acoustical Imaging Technique for Material Characterization and NDT In Automotive and Aircraft Manufacturing, 19th World Conference on Non-Destructive Testing, Munich, Germany, June 13-17, 2016
56. Maev, R. Gr., S. Titov, M. Pantea, A. Bogachenkov, N. Lehmann, A Novel Method for the Evaluation of Adhesively Bonded Joints by Spatial Filtration of Ultrasonic Signals, ASNT 25th Research Symposium, New Orleans, LA, USA, April 11-14, 2016
57. Maev, R. Gr., S. Titov, D. Doyle, C. Hatton, Ultrasonic Characterization of Anticorrosive Spray Copper Layer on Steel Nuclear Waste Containers, 32nd International Acoustical Imaging Symposium Proceedings, 32: 110-116, 2015
58. Ghaffari, B., Lazarz, K., Dekam, J., Maev, R. Gr., Titov, S., Pantea, M. Ultrasonic Inspection of Steel-adhesive and Aluminum-adhesive Multi-layered Joints, 14th International Symposium in Nondestructive Characterization of Materials, Marina Del Rey, CA, USA, June 22-26, 2015
59. Maev, R. Gr., High Resolution Ultrasonic Imaging for Car Body Quality Control, NDT in Canada, Edmonton, AB, Canada, June 15, 2015
60. Leshchynsky, V., Maev, R. Gr., Strumban, E., Dzhurinskiy, D., Maeva, E., Structure and Mechanical Properties of Thick Copper Coating Made by Cold Spray, International Thermal Spray Conference, Long Beach, CA, USA, May 11-14, 2015

61. Maev, R. Gr., Leshchynsky, V., Strumban, E., Dzhurinskiy, D., Maeva, E., Influence of Grit Blasting on the Interface Roughness and Adhesion Strength of Cold Sprayed Copper Coatings, International Thermal Spray Conference, Long Beach, CA, USA, May 11-14, 2015
62. Ghaffari, B., Lazarz, K., Dekam, J., Maev, R. Gr., Titov, S., Pantea, M. Ultrasonic Evaluation of Steel-Adhesive and Aluminum-Adhesive Multi-Layered Structures, ASNT 24th Research Symposium, Anaheim, CA, USA, March 16-19, 2015
63. Ouellette, A., Chertov, A., Maev, R. Gr., Real-Time Imaging of the Resistance Spot Weld Process Using Full Matrix Capture and the Total Focusing Technique, ASNT 24th Research Symposium, Anaheim, CA, USA, March 16-19, 2015
64. Leshchynsky, V., Bielousiva, O., Papyrin, A. Cold Spray and Reaction Sintering of Ti-TiAl3 Composite Coatings", International Thermal Spray Conference, Long Beach, May 2015
65. Maev, R. Gr., Dual Flow Supersonic Cold Spray, CleanEquity, Monaco, March 5-6, 2015
66. Ouellette, A., Chertov, A., Maev, R., The Effects of Thermal Gradients on the Real-Time 2D Imaging of the Spot Weld Process, ASNT 24th Research Symposium, Anaheim, CA, USA, March 16-19, 2015

Biomedical

1. J.G. Gelovani, J. Sadler, A. Baradarani, K. Shapoori, E.Malyarenko, P. Habashi, R.Gr. Maev, Transcranial Brain Perfusion Imaging and Quantification for the Point-of-Care Diagnosis of Stroke Associated with Traumatic Brain Injury, Military Health System Research Symposium (MHSRS), Orlando, Florida, 2022.
2. A. Baradarani, K. Shapoori, E. Malayrenko, J. Sadler, J. Gelovani, R. Gr. Maev, Detection of Hematoma Boundaries in Transcranial Ultrasound Brain Imaging via Envelope Reconstruction on Resonance-Based Signal Decomposition, IEEE Int. Conf. on Ultrasonics (IUS22), Venice, Italy, Oct. 2022
3. K. Shapoori, E. Malyarenko, J. Sadler, P. Habashi, A. Baradarani, J. Gelovani, R. Gr. Maev, Differential Diagnosis of Intracranial Hematoma Subtypes in Ex-Vivo Sheep Head Model Using Transcranial Ultrasound Brain Imaging System, IEEE Int. Conf. on Ultrasonics (IUS22), Venice, Italy, Oct. 2022
4. K. Shapoori, E. Malyarenko, J. Sadler, P. Habashi, A. Baradarani, J.G. Gelovani, and R. Gr. Maev, 3D Transcranial Ultrasound Brain Imaging for Diagnosis of Intracranial Hematomas During Early Stages of Evacuation and Management of Traumatic Brain Injuries, Military Health System Research Symposium (MHSRS), Orlando, Florida, 2022
5. Malyarenko, E., Shapoori, K., Sadler, J., Al-Ansari, M., Wydra, A., Maev, R. Gr., Transcranial Ultrasound Brain Imaging Solution for Point-of-Care Diagnosis of Traumatic Brain Injuries, International Workshop on Medical Ultrasound Tomography, Detroit, MI (Virtual) October 14-15, 2020
6. Seviaryn, F., Schreiner, G., Youssef, S., Maeva, A., Malyarenko, E., Seviaryna, I., Maev, R., Quantitative Evaluation of Skin using High-Resolution Ultrasound, SPIE Medical Imaging, Huston, Texas, 15-20 Feb, 2020
7. Maeva, A., Bamber, J., Seviaryna, I., Hopper, C., Perrett, C., Bozec, L. Effects of radiation exposure on dermal collagen: A multi modal approach, SPIE Medical Imaging, Huston, Texas, 15-20 Feb, 2020
8. Maeva, A., Strange, A., Hopper, C., Perrett, C, Seviaryna, I., Trahair, H., Levine, O., Akbar, A. High-resolution mapping of changes in properties in dermal collagen, SPIE Medical Imaging, Huston, Texas, 15-20 Feb, 2020
9. Seviaryna, I., Nakada, S., Yoshida, S., Hozumi, N., Maev, R., Multi-layered phantoms mimicking skin pathologies for high-resolution ultrasound, SPIE Medical Imaging, Huston, Texas, 15-20 Feb, 2020
10. Wang, J., Dhanapal, R. K., Ramakrishnan, P., Balasingam, B., Souza, T., Maev, R. Active RFID Based Indoor Localization. 22nd International Conference on Information Fusion, Ottawa, Canada, July 2-5, 2019

11. T. Souza, Balasingam, B., Maev, R. Gr. Autonomous Heart Rate Tracking Methodology Using Kalman Filter and the EM Algorithm. 22nd International Conference on Information Fusion, Ottawa, Canada, July 2-5, 2019
12. E. Malyarenko, K Shapoori, Sadler, J., M. Al-Ansari, Wydra, A., Maev, R. Gr., "Transcranial Ultrasound Brain Imaging Solution for Point-of-Care Diagnosis of Traumatic Brain Injuries", International Workshop on Medical Ultrasound Tomography, Oct. 14-15, Detroit, MI.2019
13. Youssef, S., Seviaryna, I., Rahman, N., Maeva, E., Shum, D., Maev, R. Gr. Ultrasonic Histology for Skin Cancer Studies, 16th Annual Oncology Research and Education Day, London, ON, June 14, 2019
14. Seviaryn, F., Schreiner, G., Youssef, S., Maeva, A., Seviaryna, I., Maev, R. Quantitative Assessment of Skin using High-Resolution Handheld Ultrasonic Scanner, Medical Ultrasound Tomography International Conference, Detroit, MI, October 14-15, 2019
15. Maev, R., Seviaryn, F., Malyarenko, E., Seviaryna, I., Schreiner, G. Handheld High-Resolution Ultrasonic Scanner for Quantitative Assessment of Skin Conditions, IEEE International Ultrasonics Symposium, , SEC, Glasgow, Scotland, UK, October 3-9, 2019
16. Maeva, A., Seviaryna, I., Hopper, C., Perrett, C., Levine, O., Akbar, A. High-Resolution Mapping of Changes in Properties in Dermal Collagen Due to Light Damage, Medical Ultrasound Tomography International Conference, Detroit, MI, October 14-15, 2019
17. Maeva, A., Seviaryna, I., Bamber, J., Bozec, L., Sound Speed and Attenuation Mapping of Collagen in Skin Tissue Due to Light Damage, IEEE International Ultrasonics Symposium, October 3-9, 2019, SEC, Glasgow, Scotland, UK
18. Shapoori, K., E. Malyarenko, Sadler, J., A. Waspe, J. Drake, Maev, R. Gr., "Precise Transcranial Ultrasound Imaging/HIFU by Adaptive Beamforming via a Dual-Mode Hand-Held Probe", Poster presentation, IEEE International Ultrasonics Symposium, Kobe, Japan, October 2018. Poster
19. Rahman, N., Seviaryna, I., Youssef, S., Nazer, R., Maeva, E., Malyarenko, E., Shum, D., Maev, R. Gr. Digital Ultrasonic Histology for Skin Cancer Diagnosis, 4th International Cancer Research Conference, Windsor, ON, November 17, 2018 Poster
20. Rahman, N., Seviaryna, I., Youssef, S., Nazer, R., Shum, D., Maev, R. Characterizing Cutaneous Skin Carcinomas with High-Resolution Acoustic Microscopy, 4th International Cancer Research Conference, Windsor, ON, November 17, 2018.
21. Schreiner, G., Seviaryn, F., Youssef, S., Maeva, E., Seviaryna, I., Malyarenko, E., Maev, R. Melanoma Detection with Cutaneous Hand-held High-Frequency Ultrasonic Microscope, 4th International Cancer Research Conference, Windsor, ON, November 17, 2018
22. Seviaryna, I., Maev, R., Rahman, N., Youssef, S., Nazer, R., Maeva, E., Malyarenko, E., Shum, D., Yoshida, S., Hozumi, N. Ultra-High Resolution Acoustic Microscopy for Cancer Studies, 4th International Cancer Research Conference, Windsor, ON, November 17, 2018
23. Maev, R., Seviaryna, I., Youssef, S., Yoshida, S., Hozumi, N., Shum, D., Fujii, R. Characterization of human skin with acoustic impedance: estimation of skin layers' thickness, CARO-COMP-CAMRT 2018 Joint Scientific Meeting, Montreal, at Radiotherapy&Oncology V. 129, Supplement 1, p. S50, 2018 September 12-16, 2018,
24. Iwamoto, S., Takanashi, K., Seviaryna, I., Maev, R., Kobayashi, K., Hozumi, N., Yoshida, S. Quantitative Monitoring for Cerebellar Abnormal Development of Acoustic Model Animals using Acoustic Impedance Pattern, 38th Symposium on Ultrasonic Electronics, Kyoto, Japan, October 25-28, 2017
25. Seviaryna, R. Maev, S. Youssef, S. Yoshida, N. Hozumi, D. Shum. Use of high-resolution acoustic microscopy for skin cancer diagnosis: correlation with histology, CARO-COMP-CAMRT 2018 Joint Scientific Meeting, Montreal, at Radiotherapy&Oncology V. 129, Supplement 1, p. S50 2018 September 12-16, 2018, Poster

26. Rahayu, R. H., Takanashi, K., Soon, T. T. K., Seviaryna, I., Maev, R., Kobayashi, K., Hozumi, N., Yoshida, S. Quantitative Research of the Effects of Anticancer Drugs on Cultured Breast Cancer Cells Using Ultrasonic Microscopy, 38th Symposium on Ultrasonic Electronics, Kyoto, Japan, October 25-28, 2017, Proceedings of Symposium on Ultrasonic Electronics, Vol. 38, 3P5-4
27. Kamp, J., Malyarenko, E., Chen, D., Wydra, A., Maev, R. Gr., The Development of a Practical Ultrasonic System for Cross-Sectional Imaging of Small Animals, AAPM 2015, 57th Annual Meeting & Exhibition, Anaheim CA, July 12-16, 2015
28. Kamp, J., Malyarenko, E., Maev, R. Gr., The Development of a Practical Ultrasonic System for Cross-Sectional Imaging of Small Animals, GLC AAPM Young Investigators Symposium, Troy MI, June 11, 2015
29. Maev, R. Gr., Handheld device for Diagnostics of Pulmonary and Abdominal Pathologies by percussion – statistical evaluation of the human factor, Fort Lauderdale, 2015
30. Shapoori, K., Maev, R. Gr., Adaptive Focusing via Ultrasonic Phased Arrays through Phase-Aberrating Layered Structures, ASNT 24th Research Symposium, Anaheim, CA, USA, March 16-19, 2015
31. Maev, R. Gr., Portable Device for Diagnostics of Pulmonary Injury and Pathology, Office of Naval Research and Health Protection, Computational and Cellular Biology of BLAST and Combat Casualty Care Program Meeting, Arlington, VA, USA, February 23-24, 2015
32. Maev, R. Gr., Ultrasonic Imaging of Brain Structures, Blood Vessels, and Foreign Objects through Thick Skull Bones, Office of Naval Research and Health Protection, Computational and Cellular Biology of BLAST and Combat Casualty Care Program Meeting, Arlington, VA, USA, February 23-24, 2015
33. Sandhu, G.Y.S., Li, C, Roy, O, Schmidt, S, Duric, N. High-resolution quantitative whole-breast ultrasound: in vivo application using frequency-domain waveform tomography. Proc. SPIE, Medical Imaging. 2015: 9419
34. Sak M., Duric, N, Littrup, P, et al. Comparison of breast density measurements made using ultrasound tomography and mammography. Proc. SPIE, Medical Imaging. 2015, March: 94190R.

Biometrics

1. Maev, R. Gr., F. Severin, A. Baradarani, Deep Layer Fingerprint Imaging with High-speed Ultrasonic System, SPIE Defense and Commercial Sensing Conference, Baltimore, MD, USA, April 17-21, 2016
2. A. Baradarani, J. R. B. Taylor, F. Severin, Maev, R. Gr., "Advanced fingerprint verification software," Proc. SPIE 9825, Sensors, and Command, Control, Communications, and Intelligence (C3I) Technologies for Homeland Security, Defense, and Law Enforcement Applications XV, 98250E (May 12 2016); https://doi.org/10.1117/12.2224244
3. Baradarani, A., Taylor, J., Severin, F., Maev, R. Gr., Advanced Fingerprint Verification Software, SPIE Defense and Commercial Sensing Conference, Baltimore, MD, USA, April 17-21, 2016
4. Maev, R. Gr., F. Severin, 3D Acoustic Microscopy of Fingerprints, 32nd International Acoustical Imaging Symposium Proceedings, 32: 79-84, 2015

Art

1. Maev, R. Gr., The state-of-the art Innovative Technologies for Non-Destructive Analysis of the Fine Art Objects and the Cultural and Historical Heritage, Analysing Art: New Technologies – New Applications Workshop, St. Petersburg, Russia. July 25-27, 2018
2. Maev, R. Gr., The Innovative Solutions for Non-Invasive Evaluation of the Fine Art and the Cultural Heritage Object for Forgery Detection via Unique Patterns Matching, 12th ECNDT Conference, Gothenburg, Sweden, June 11-15, 2018
3. Maev, R. Gr., State-of-the-art Innovative Technologies for Non-destructive Analyses of the Objects
4. of Fine Art and Cultural and Historical Heritage, 56th Annual BINDT Conference, Telford, UK, September 5-7, 2017

5. Maev, R. Gr., State-of-the-art Innovative Technologies for Non-destructive Analyses of the Objects of Fine Art and Cultural and Historical Heritage, 54th Annual BINDT Conference, Telford, UK, September 8-10, 2015
6. Maev, R. Gr., The State-of-the-Art Innovative Technologies for Nondestructive Analysis of the Fine Art Objects and the Cultural and Historical Heritage, 14th International Symposium in Nondestructive Characterization of Materials, Marina Del Rey, CA, USA, June 22-26, 2015
7. Maev, R. Gr., A Review of Imaging Methods in Analysis of Works of Art: Thermographic Imaging Method in Art Analysis, Canadian Association of Physicists Congress, Edmonton, AB, Canada, June 15-19, 2015

INVITED AND KEYNOTE PRESENTATIONS

Industrial

1. Roman Gr. Maev, NDE 4.0. Realizing zero-defect mass production of bonded joints by integrating AI into the advanced real-time ultrasonic quality monitoring process, CINDE International Conference, May 18, 2022, Windsor, Canada.
2. R. Gr. Maev, New approaches for "zero-defective" mass-manufacturing production using ultrasonic real-time monitoring of bonded joints quality based on deep learning neural network, 16th IS NDCM, Baltimore, USA, 10 August 2021
3. Maev, R. Gr., Advances in Modern Mass-Manufacturing using NDE 4.0 Process based on Artificial Intelligence. Annual School of the Russian Society for Non-destructive "International Certification in the Global NDE World", Sochi, Russia, October 3-5, 2020 (Virtual event)
4. Maev, R. Gr., Novel results in development of quantitative ultrasonic imaging diagnostic in medicine, industry, and art analyses, Presidium of Russian Academy of Sciences, Moscow, Russia, September 18, 2020
5. R Gr. Maev, Invited Lecture: Revolutionize Mass-manufacturing process using Artificial Intelligence NDE 4.0 Ultrasonic Quality Control Process, IEEE UFFC Symposium 2020, MGM Grand Hotel, Las Vegas, Nevada, USA. September 7 – 11, 2020 (Virtual event)
6. R Gr. Maev, Invited Talk: NDE 4.0. New approaches for "zero-defective" mass-manufacturing production using ultrasonic real-time monitoring of bonded joints quality based on deep learning neural network for machine learning algorithms. Russian Society for Non-destructive Testing Annual Conference, Moscow, Crocus Centre, Russia, March 3-5, 2020
7. R Gr. Maev, Invited Lecture: Advances in Modern Mass-Manufacturing using NDE 4.0 Process based on Artificial Intelligence, National School "International Certification in NDE Global World", Sochi, Russia, October 3-5, 2020 (Virtual Event)
8. Maev, R. Gr., Adaptive Ultrasound Phased-Array Techniques for Imaging of Laser Brazed Joints in the Automotive Sector, Invited Presentation, ASNT Annual Conference, Las Vegas, USA, November, 2019
9. Maev, R. Gr., Advances in Modern Mass-manufacturing using NDE 4.0 Process Based on Artificial Intelligence, Keynote Speaker, BINDT 58th Annual conference, Telford, UK, September, 2019
10. Maev, R. Gr., Advances in modern mass-manufacturing using NDE 4.0 process based on artificial intelligence, Opening Plenary Paper – Roy Sharpe Prize Lecture: 3-5 September 2019, The International Centre, Telford, UK 58th Annual British Conference on Non-Destructive Testing
11. Maev, R. Gr. and J. Wladarski, Innovative Dual Flow Cold Spray Technology for In-Line Asset Maintenance and Power Line Loss Reduction, Distributech Conference & Exhibition, New Orleans, LA, February 5-7, 2019
12. Maev, R. Gr., Low pressure spray of stainless-steel based composite coatings, particle strain localization process. International Thermal Spray Conference & Exposition, Dusseldorf, Germany, June 7-9, 2017

13. Maev, R. Gr., Advances in High Resolution Imaging for Composite Materials Quality Control, AVIC-ACC Intergovernment Canada-China Meeting, Beijing, China, April 21, 2017
14. Maev, R. Gr., Advances in Acoustic Microscopy and High Resolution Imaging: from Principles to Applications, University of Florence, Florence, Italy, June 7, 2016
15. R .Gr. Maev, "Innovation Drives Quality" - New Generation of High Resolution Acoustical Imaging Technique for Material Characterization and NDT In Automotive and Aircraft Manufacturing, 19th World Conference on Nondestructive Testing, Munich, Germany, June 13-17, 2016
16. I. Seviaryna, Maev, R. Gr., "Green" NDE Techniques for "Green" Materials, Workshop Automotive Industry, Climate Change Solution for Canadian Auto sectors, Dec12, 2016, Toronto, ON
17. Maev, R. Gr., Advances in Acoustic Microscopy and High Resolution Imaging: From Principles to Applications, AVIC Composite Corporation, The Centre of Testing Technology for Composites, Peking, China, December 3, 2015
18. Maev, R. Gr., Innovation Drives Quality: New Generation of High Resolution Imaging Technique for Material Characterization and NDT in Automotive Manufacturing, National University of Singapore, Singapore, November 6, 2015
19. Maev, R. Gr., Advances in Acoustic Microscopy and High Resolution Ultrasonic Imaging: From Principles to New Applications, National University of Singapore, Singapore, November 6, 2015.
20. Maev, R. Gr., High Resolution Ultrasonic Imaging for Car Body Quality Control, NDT in Canada, Edmonton, AB, Canada, June 15, 2015
21. Maev, R. Gr., Nanostructured Composite Coatings Layer Structures Made by Cold Spray Process, Birkbeck University, University College London, London, UK, May 26, 2015
22. Maev, R. Gr., Practical and Cost Effective Role of Novel NDT and Digital Quality Control Process of Lightweight (both Aluminum and Composite) Vehicles' Various Joining and Bonding Technologies, BMW, Munich, Germany, May 4, 2015
23. Maev, R. Gr., New Principles for Rapid 2D and 3D Image Quantitative Evaluation of Bulk and Sub-surface Properties and Microstructure Based on a New Concept of Advanced Portable Systems, Fraunhofer IKTS Institute, Dresden, Germany April 30, 2015
24. Maev, R. Gr., Evaluation of Adhesive Bonds Joints in Sheet–Metal Assemblies by Ultrasonic Pulse-Echo Technique, Porsche Workshop, Leipzig, Germany April 28, 2015
25. Maev, R. Gr., Real-time Imaging of the Resistance Spot Weld Process Using Full Matrix Capture and Ultrasonic Focusing Technique, FFT EDGAR, Fulda, Germany April 27, 2015
26. Maev, R. Gr., Advanced Concepts of Integrating Modern Nondestructive Evaluation of Joining and Bonding Quality into the Production System at the Intelligent Advance Manufacturing, Bosch Workshop, Erbach Odenwald, Germany, April 24, 2015
27. Maev, R. Gr., New Solutions for a Portable High Resolution Acoustical Imaging Systems for NDT in Car Manufacturing, Daimler, Sindelfingen, Germany April 23, 2015
28. Maev, R. Gr., Tribology and Mechanical Behavior of Cold Sprayed Materials, GE (Oil &Gas), Antwerp, Belgium, March 23, 2015
29. Maev, R. Gr., Dual Flow Supersonic Cold Spray, CleanEquity Conference, Monaco, March 5-6, 2015.
30. Maev, R., High Resolution Ultrasonic Imaging for Car Body Quality Control, NDT in Canada 2015 Conference, Edmonton, AB, Canada, June 15, 2015

Biomedical

1. J. G. Gelovani, J. Sadler, A. Baradarani, K. Shapoori, E. Malyarenko, P. Habashi, R. Gr. Maev, Transcranial Brain Perfusion Imaging and Quantification for the Point-of-Care Diagnosis of Stroke Associated with Traumatic Brain Injury, Military Health System Research Symposium (MHSRS), Orlando, Florida, 2022
2. K. Shapoori, E. Malyarenko, J. Sadler, P. Habashi, A. Baradarani, J.G. Gelovani, and R. Gr. Maev, 3D Transcranial Ultrasound Brain Imaging for Diagnosis of Intracranial Hematomas During Early Stages

of Evacuation and Management of Traumatic Brain Injuries, Military Health System Research Symposium (MHSRS), Orlando, Florida, 2022

3. R. Gr. Maev, New Results of Research and Development in the Field of Ultrasound Diagnostics in Medicine. VII International Conference Innovative Concepts and Technologies for Biomedical Applications, ICTBA, May 24, 2021
4. Maev, R. Gr. A Transcranial Ultrasound Brain Imaging System for point-of-injury/point-of-care diagnosis of Brain Hematoma, International Virtual Conference on Innovation in the Medical Diagnostics, Rome-Moscow, May 25, 2021
5. Maev, R. Gr., A Transcranial ultrasound brain imaging system for point-of-injury/point-of-care diagnosis of Brain hematoma and bast-related TBI. London Clinical Trauma Centre, London, UK, 19 January 2020
6. Maev, R. Gr., Development of a Transcranial Ultrasound Brain Imaging Instrument for Diagnosis of Intracranial Hematomas. Henry M. Jackson Foundation, Center for Neuroscience and Regenerative Medicine (CNRM), Bethesda, MD, USA, November 18, 2020 (Virtual event)
7. Maev, R. Gr., New Results of Research and Development in the Field of Ultrasound Diagnostics in Medicine. New Results Fundamental Problems of Biomedical Radio Electronics: Interdisciplinary Approaches and Modern Challenges Conference, Russian Academy of Sciences, Moscow, Russia, November 26-27, 2020
8. Maev, R. Gr., Handheld High-Resolution Ultrasonic Scanner for Quantitative Assessment of Skin Conditions, Invited Presentation, IEEE International Ultrasonics Symposium, Glasgow, Scotland, UK, October 20, 2019
9. T.Souza, B. Balasingam, & R. Gr.Maev, Autonomous Heart Rate Tracking Methodology Using Kalman filter and the EM Algorithm, 22nd International conference on Information Fusion, Ottawa, Canada, July, 2019
10. Maev, R. Gr., High Resolution Acoustic Microscopy for Skin Melanoma Diagnosis. Frontiers in Molecular and Functional Imaging. Wayne State University. 2017
11. Maev, R. Gr., Portable Device for Diagnostics of Pulmonary Injury and Pathology, Computational Cellular Biology of Blast Science and Technology Seminar, Office of Naval Research, Arlington, VA, USA, February 23-24, 2015
12. Maev, R. Gr., Review of Biomedical Diagnostic Research for Ultrasound Imaging in Stomatology for Implant and Periodontal Applications, Peking University Hospital, The Centre of Stomatology, Peking, China, December 4, 2015
13. Maev, R. Gr., Review of Biomedical Diagnostic Research for Ultrasound Imaging of Brain Structures and Blood Vessels through Thick Skull Bones and New Lifelike Phantom for Such Applications, Institute for Tumor Diagnosis and Therapeutical Physics, Peking University, Peking, China, December 4, 2015
14. Maev, R. Gr., High Resolution Imaging: Principles and Applications, Toyohashi University of Technology, Toyohashi, Japan, November 27, 2015
15. Maev, R. Gr., Quantitative Acoustic Microscopy Methods for Biomedical Applications, Honda Electronics, Toyohashi, Japan, November 27, 2015
16. Maev, R. Gr., Portable Imaging Systems for Medical Diagnostics, Konica Minolta, Tokyo, Japan, November 26, 2015
17. Maev, R. Gr., Portable Medical Imaging Equipment for Smart Ambulance Project, CMP Trading Company, Seoul, Korea, November 23, 2015
18. Maev, R. Gr., Phantoms for Medical Imaging Research and Medical Training, Ybrain, Seoul, Korea, November 23, 2015
19. Maev, R. Gr., Novel Portable Emergency Transcranial Acoustical Imaging System, Precision Microcircuits, New Plymouth, New Zealand, November 19, 2015

20. Maev, R. Gr., Novel Portable Emergency Transcranial Acoustical Imaging System, Callaghan Innovation, Auckland, New Zealand, November 13, 2015
21. Maev, R. Gr., Advanced Digital Medical Diagnostics Technologies for Heath Care Applications, MaRS/ICE Workshop Samsung Health Care, Toronto, ON, Canada, July 10, 2015
22. Maev, R. Gr., Ultrasonic Imaging of Brain Structures, Blood Vessels, and Foreign Objects through Thick Skull Bones, Computational Cellular Biology of Blast Science and Technology Seminar, Office of Naval Research, Arlington, VA, USA, February 23-24, 2015

Biometrics

1. Maev, R. Gr., An original ultrasonic fingerprint imaging system for generating a three-dimensional representation of a finger pad, including a surface tissue layer and a subsurface tissue layer. Huawei S&T Centre, Huawei Headquater, Guanghou, China, April 19, 2017
2. Maev, R. Gr., Physical Principles and Novel Methods of the Scanning Acoustic Microscopy and its Application for Biomedical, Biometrics and Industrial Fields, Kotel'nikov Institute of Radio Engineering and Electronics of Russian Academy of Sciences, Moscow, Russia, September 18, 2015
3. Maev, R. Gr., 3D Fingerprint Biometric Security Identification Methods and Systems, Meeting with Samsung Headquarters, Seoul, Korea, November 24, 2015

Art

1. R. Gr. Maev, The Innovation Solutions for Non-Invasive Identification of Art Objects Forgery Deterction via Unique Pattern Matching, Analysing Art: New Technologies - New Applications, Florence, Italy, April 24-27, 2022
2. R. Gr. Maev, The Innovative Non-Invasive Complex Solutions for Security Purposes to Defend Against Forgeries of the Fine Art, 16th IS NDCM, Baltimore, USA, 11 August 2021
3. Maev, R. Gr., State-of-the-art innovative technologies for nondestructive analysis of objects of fine art and cultural and historical heritage, BINDT, London Branch Meeting, April 7, 2021
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7. Maev, R. Gr., The state-of-the art Innovative Technologies for Non-Destructive Analysis of the Fine Art Objects and the Cultural and Historical Heritage, Analysing Art: New Technologies – New Applications Workshop, St. Petersburg, Russia. July 25-27, 2018
8. Maev, R. Gr., The Innovative Solutions for Non-Invasive Evaluation of the Fine Art and the Cultural Heritage Object for Forgery Detection via Unique Patterns Matching, 12th ECNDT Conference, Gothenburg, Sweden, June 11-15, 2018
9. Maev, R. Gr., State-of-the-art Innovative Technologies for Non-destructive Analyses of the Objects of Fine Art and Cultural and Historical Heritage, Plenary Paper, 56th Annual BINDT Conference, Telford, UK, September 5-7, 2017
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12. State-of-the-art Innovative Technologies for Non-destructive Analyses of the Objects of Fine Art and Cultural and Historical Heritage, Keynote Speech, 54th Annual BINDT Conference, Telford, UK, September 8-10, 2015
13. Maev, R. Gr., The State-of-the-Art Innovative Technologies for Nondestructive Analysis of the Fine Art Objects and the Cultural and Historical Heritage, 14th International Symposium in Nondestructive Characterization of Materials, Marina Del Rey, CA, USA, June 22-26, 2015
14. Maev, R. Gr., A Review of Imaging Methods in Analysis of Works of Art: Thermographic Imaging Method in Art Analysis, Canadian Association of Physicists Congress, Edmonton, AB, Canada, June 15-19, 2015
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2. R.Gr. Maev, V. Leshchynsky, E. Strumban, D. Ziganshin, R. Belenkov, D. Dzhurinskiy, Apparatus and Method for Cold Spraying and Coating Processing, GB Patent No. GB2558491, Filed: November 4, 2016, Issued: February 23, 2022
3. J. Sadler, R.Gr. Maev, E. Malyarenko, A Method to Obtain 3D Images of a Flowing Region Beneath an Object Using Speckle Reflections, Canadian Patent Number 2,870,141, Filed: April 15, 2013, Issued: August 18, 2020
4. R.Gr. Maev, K. Shapoori, E.V. Malyarenko, An Ultrasonic Adaptive Beamforming Method and its Application for Transcranial Imaging, ZL.201580069648.7, Filed: November 9, 2015. Issued: August 11, 2020
5. E. Malyarenko, R.Gr. Maev, A. Ilyutovich, Ultrasonic Device for Assessment of Internal Tooth Structure, US Patent Number 10,603, 008, Filed: February 19, 2019, Issued: March 31, 2020
6. R. Gr. Maev, V. Leshchynsky, E. Strumban, D. Zhiganshin, R. Belenkov, & D. Dzhurinsky, Apparatus and Method for Cold Spraying and Coating Processing, US Patent Number 10,329,670 B2, Filed: Nov. 4, 2016, Issued: June 15, 2019
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9. R.Gr. Maev, K. Shapoori, E.V. Malyarenko, An Ultrasonic Adaptive Beamforming Method and its Application for Transcranial Imaging, EP 3,215,868 B1, Filed: November 9, 2015. Issued: October 3, 2018
10. B. Slak, E. Strumban, R.Gr. Maev, Ultrasonic Device for Dental Implant Navigation, US Patent Number 9,986,968, Filed: December 5, 2015, Issued: June 5, 2018
11. A.R. Maeva, R.Gr. Maev, L.A. Denisova, Ultrasonic Device for Cosmetological Human Nail Applications, US Patent Number 9,743,906, Filed: June 2, 2008, Issued: August 29, 2017

12. R.Gr. Maev, A. Chertov, Ultrasonic In-process Monitoring and Feedback of Resistance Spot Weld Quality, US Patent Number 9,296,062, Filed: June 10, 2013, Issued: March 29, 2016
13. J. Sadler, R.Gr. Maev, E. Malyarenko, Method to Obtain 3D Images of a Flowing Region Beneath an Object Using Speckle Reflections, US Patent Number 9,613,401, Filed: April 15, 2013, Issued: April 4, 2017
14. R.Gr. Maev, F. Seviaryn, Biometric Sensor and Method for Generating a Three-Dimentional Representation of a Portion of a Finger, US Patent Number 8,977,013, Filed: July 12, 2011; Issued: March 10, 2015

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2. R. Gr. Maev, A. Ouellette, A. Chertov, Ultrasonic Micro-Array Imaging System, US Provisional Application Number 17/873,498, Filed: July 26, 2022
3. B. Ghaffari, E. Hetrick, R. Gr. Maev, and A. Ouellette, "Non-Destructive Evaluation System for Inspection of Weld and Braze Joints," US Patent, Submitted 5/12/2021
4. R. Maev, Leshchynsky, V., E Strumban, et al. -3D /printing method of forming bulk solid structure element by cold spray, US Patent Application #: 62/375,685
5. R. Maev, Leshchynsky, V., E Strumban, et al. - Hopper with microreactor and cartridge for low pressure cold spray, US Patent Application #: 62/384,353
6. R.Gr. Maev, V. Leshchynsky, E. Strumban, D. Dzhurinsky, & Z. Baran, Hopper with Microreactor and Cartridge for Low Pressure Cold Spraying, US Patent Number 10,300,445 B2, Filed: September 7, 2017
7. R. Maev, Leshchynsky, V., E Strumban, et al.- Apparatus and method for cold spraying and coating processing (US Patent Application #: 62/250,548)

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3. R.G. Maev, et al, "Non-Destructive Evaluation of Laser Brazed and Laser Welded Joints" Report to Ford, USA, June, 2022
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23. Maev, R. Gr., Technical Report at Windsor Ford-IDIR Meeting 2018/04/06, "Development, Characterization and Validation of MIL-based multilayer TBC Coatings: State of Art, Preliminary Results and Program
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25. Maev, R. Gr., Development of Al Vehicle Skin Repair by Low Pressure Cold Spray, Progress Report for the Ford Motor Company July 08, 2015.
26. Maev, R. Gr., Instruments and methods for high-resolution transcranial ultrasonic imaging of the brain, Final Report for the Wayne State University President's Research Enhancement Program: BRAIN Research, 10.11. 2016
27. Maeva, E., Seviaryna, I., Elseddawy, A., Birat K.C, Maev, R., "Ultrasonic evaluation of the engine cover prototype before and after impact test", Ford Powertrain Engineering Research and Development Centre (PERDC), Windsor, ON, December 8, 2015
28. KC, B. Akhshik, M. Tjong, J., Sain, M. Seviaryna, I. Maeva, E. Bueno, H.G., "Design and Development of Engine Beauty Cover", Sustainable Materials Workshop, Ford Powertrain Engineering Research and Development Centre (PERDC), Windsor, ON, December 8, 2015

APPENDIX D

RESEARCH FUNDING

GRANTS

Project Years		Funding Agency, Title of Project, Partners, PI	Total Funding
Start	End		
2022	2023	Canada Foundation for Innovation-Large Infrastructure Fund Advanced Cold Spray Additive Manufacturing Facility – S. Yue (PI), McGill University, R. Maev (Co-Applicant)	$318,078
2021	2024	Natural Science and Engineering Research Council Canada Alliance Grant *Development of a new adaptive spot weld controller driven by an ultrasonic monitoring system* with NADEX and CEL– R. Maev (PI), R. Gras (Co-applicant).	$962,400
2020	2023	Natural Science and Engineering Research Council Canada Collaborative Research and Development Grant *Thermal sprayed battery cell terminal electrical interconnection*, with Ford Motor Co – R. Maev (PI)	$856,074
2020	2022	MITACS Accelerate Award *Methodology development and implementation of a platform for nondestructive evaluation of both butt-fused and electrofused polyethylene pipe joints using ultrasound and deep learning*, with Jana Corporation – R. Maev (PI).	$210,000
2019	2020	MITACS Accelerate Award *Methodology development for the nondestructive quality assessment of joints in polyethylene pipes based on ultrasound technology*, with InDepth Technologies Inc – R. Maev (PI)	$150,000
2019		MITACS Accelerate Award *Advancement and evaluation of novel quantitative ultrasound method for tissue characterization in dental diagnostics*, with Grayson Dental – R. Maev (PI)	$30,000
2019		MITACS Globalink Partnership Award *Investigation on aerosol cold spray technology for ceramic coatings deposition* – R. Maev (PI), A. Elseddawy (Intern)	$6,000
2018		Natural Science and Engineering Research Council Canada Engage Grant *Enhanced Biometrics System with Object Detection for Airport Airside Access*, with Greater Sudbury Airport and CARIC – R. Maev (PI)	$35,000
2018	2023	Natural Science and Engineering Research Council Canada Collaborative Research and Development Grant *Cluster; Novel Quantitative Nondestructive Quality Evaluation of Advanced Joining and Consolidation Manufacturing Processes,* with Bombardier Aerospace, Enwin Energy, Ford Motor of Canada, Narmco Group and CARIC, R. Maev (PI), A. Sobiesiak (Co-applicant), E. Maeva (Co-applicant)	$5,488,206
2018		MITACS Globalink Partnership Award *High-frequency ultrasound and optical coherent tomography – application for imaging, diagnosis, and measurements on samples of soft and hard tissues* – R. Maev (PI), B. Slak (Intern)	$17,500

2017	2023	Natural Science and Engineering Research Council Canada CREATE Grant *Innovative Program on NDT (Non Destructive Testing) oN DuTy!* - X. Maldague (PI), R. Maev (Co-applicant)	$2,037,500 *(R Maev portion approx 20%)*
2017	2018	MITACS Accelerate *Low Pressure Cold Spray Technology-based Repair Process for Damaged Automotive Aluminum Alloys Panels*, with Tessonics Corp – A. Sobiesiak (PI)	$223,333
2016	2018	MITACS Accelerate *Development of a Novel Ultrasonic Dental System for Alveolar Bone Mapping*, with Centre Dental Clinic – R. Maev (PI)	$90,000
2016	2017	MITACS Accelerate *Proof of Concept: Real-Time Integrated Weld Analyzer in Aluminum Spot Welds*, with Alcoa – R. Maev (PI)	$45,000
2016	2017	MRIS Strategic Sector Support Funding *IDIR Commercialization Plan* – R. Maev (PI)	$500,000
2016	2016	Natural Science and Engineering Research Council Canada Engage Grant *Rapid Repair for Fuselage Damage using Cold Spray*, with Bombardier Aerospace and CARIC – R. Maev (PI)	$71,000
2014	2015	Natural Science and Engineering Research Council Canada Idea 2 Innovation – Market Assessment *Development of a Novel Ultrasonic Image-guided Positioning System for Dental Implantology* – R. Maev (PI)	$15,045
2014	2016	Natural Science and Engineering Research Council Canada Collaborative Research and Development Grant *Field Corrosion Protection of Welded Joints in Pipeline Systems by Low Pressure Cold Spray,* with EnWin Utilities - R. Maev (PI)	$612,000
2013	2018	Natural Science and Engineering Research Council Canada APC *Design and Manufacturing of Direct Micro- and Long-Fibre Lightweight Composites*, with University of Toronto and Ford Motor Co – M. Sain (PI), R. Maev (Co-applicant)	$2,326,000 *($522,000 R Maev Portion)*
2013	2016	ISTP Canada *Microfibre-based innovative structural auto parts,* with University of Toronto and Ford Motor Co - J. Tjong (PI), M. Sain (Co-investigator), R. Maev (Co-investigator)	$300,000 *($82,438 R Maev Portion)*
2013	2016	Fed Dev *Institute for Border Logistics and Security / Cross Border Institute* - W. Anderson (PI), R. Maev (Collaborator)	$7,291,785 *($704,350 R Maev Portion)*

CONTRACTS

Project Years		Funding Partner, Title of Project, PI	Total Funding
Start	**End**		
2018	2020	Ford Motor Co – Contract *Low-cost thermal spray coating for improved high-temperature aluminum pistons* – R. Maev (PI)	$209,160 USD
2018		Hotel Dieu Grace Hospital – Contract *RFID Monitoring System* – R. Maev (PI)	$23,397
2018	2023	Ford Motor Co - Contract	$280,000

		Develop a Nondestructive Evaluation Method for Robust Inspection of Laser Beam Welded and Laser Beam Brazed Joints in an Automotive Manufacturing Environment phase 2 – R. Maev (PI)	
2016	2018	Ford Motor Co - Contract *Develop a Nondestructive Evaluation Method for Robust Inspection of Laser Beam Welded and Laser Beam Brazed Joints in an Automotive Manufacturing Environment* – R. Maev (PI)	$187,004
2016	2016	Enersource – Contract *DFSCS process application to repair electric equipment* – R. Maev (PI)	$32,497