THE UNIVERSITY OF BRITISH COLUMBIA

Materials & Manufacturing Research Institute

Annual Report 2019-2020

Collaborative Expertise for Innovative Solutions

Summary and Highlights

- New collaborative research initiatives: Circular Economy Seed Funding Program through the National Research Council of Canada Industrial Research Assistance Program; NFRF-Exploration on smart manufacturing; Establishment of BioComposites Research Network
- Members: 89 academic and 58 industry
- Members success: Over $25M research funding; Over 380 articles; Over 200 HQP trainee
- Events: Image Guided Therapeutics: From Conception to Commercialization; Biocomposites Research Network: 2020 Research Day; Speaker Series
- Supporting team-based grant proposals: NSERC CREATE on Advanced Bio-based Materials; NFRF Transformation on Global Plastics Observatory (GPO): A Data-Driven International Strategy on Zero-Waste Plastics; Multiple funding proposals submitted to UBCO Eminence
- Staffing: One new full-time and one new part-time staff was recruited through the awarded grants

Materials and Manufacturing Research Institute (MMRI) is a multidisciplinary, interdepartmental research hub at the University of British Columbia (UBC) fostering collaboration between local, national and international R&D sectors.

Mission

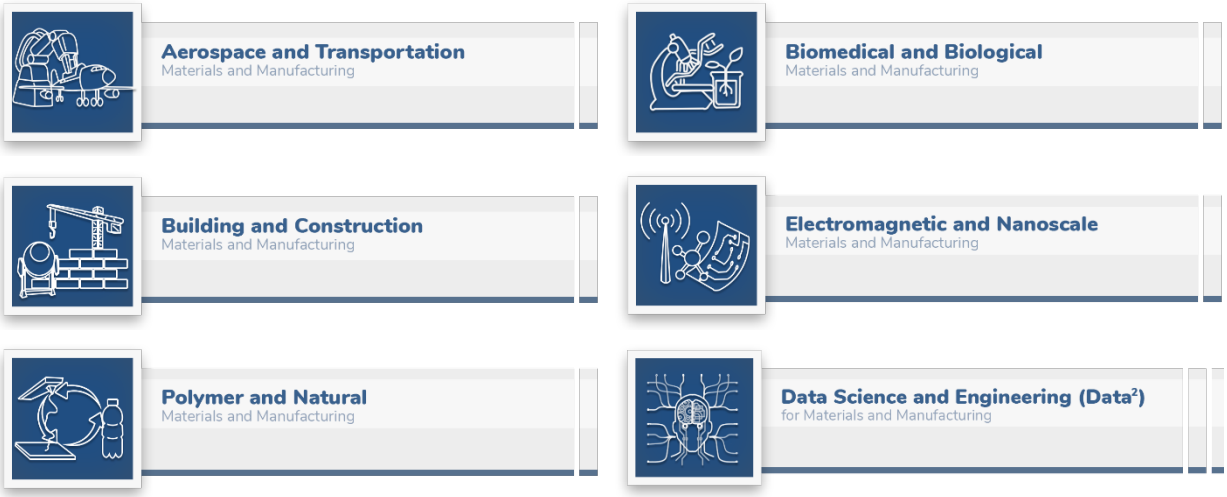
To build on UBC's existing strengths in materials and manufacturing research and create new opportunities for multidisciplinary research in related emerging areas through shared knowledge and network-based funding.

Vision

MMRI will be a role model linking basic and applied science and contributing to knowledge advancement in multidisciplinary research areas of advanced materials and manufacturing, through close partnership between UBC faculty and other sectors of academia, industry and government organizations; and by world-class training of students and scientists, and dissemination of high-quality research.

Operations

Structure: MMRI currently has six research pillars that host researchers from a wide range of disciplines across both campuses of UBC and beyond. These pillars include:



In addition, the Institute has launched a Cross-Disciplinary Initiative on Design for Industry 4.0 to foster concerted activities among members around the emerging field of smart manufacturing and factories of the future.

Management team: Each MMRI research pillar has one dedicated Lead from the Point Grey campus and one Lead from the Okanagan campus who oversee and coordinate the pillar activities. A Chief Development Officer is also leading Cross-Disciplinary Initiative. The MMRI management team is listed below:

- Director: Dr. Abbas Milani (Engineering, UBCO)
- ATMM Leads:
  - Dr. Warren Poole (Materials Engineering, UBCV)
  - Dr. Lukas Bichler (Engineering, UBCO)
- BBMM:
  - Dr. York Hsiang (Surgery, UBCV)
  - Dr. Hadi Mohammadi (Engineering, UBCO)
- BCMM:
  - Dr. Nemkumar Banthia (Civil Engineering, UBCV)
  - Dr. Shahria Alam (Engineering, UBCO)

- ENMM:
  - Dr. Lorne Whitehead (Physics and Astronomy, UBCV)
  - Dr. Kenneth Chau (Engineering, UBCO)
- PNMM:
  - Dr. Frank Ko (Materials Engineering, UBCV)
  - Dr. Gino DiLabio (Chemistry, UBCO)
- DSEMM:
  - Dr. Bhushan Gopaluni (Chemical and Biological Engineering, UBCV)
  - Dr. John Braun (Mathematics, UBCO)
- Design for Industry 4.0:
  - Dr. Homayoun Najjaran (Engineering, UBCO)

Membership: MMRI continues to integrate new members from academia and industry into its research structure. The Institute currently boasts 89 academic and 58 industry members.

Space/facilities: Since January 2018, the institute has been officially located in EME 2131 on UBC Okanagan campus.

Staff and administration: MMRI currently has three full-time and one part-time staff as listed below:

- Research Engineer:
  - Mahdi Takaffoli, PhD (full-time)
  - Bryn Crawford, MSc (full-time)
  - Isabelle Curyk, BSc (part-time)
- Administrative Assistant:
  - Jolene Campbell, BBA (full-time)

Academic measures

The academic measures reported in this section is based on the information collected from members on their academic records from September 2019 until August 2020.

Grants: MMRI members has received over $25M research funding from different funding sources. See Appendix I for the list of sample grants.

Publications: MMRI members published over 380 articles in peer-reviewed journals. See Appendix II for the list of sample publications.

Trainee supervision: MMRI members have been supervising more than 200 graduate students.

Members Success Stories

Dr. Cigdem Eskicioglu

Awarded an Industrial Research Chair by NSERC and Metro Vancouver in advanced resource recovery from wastewater

Dr. Abbas Milani

Named as a new member of the Royal Society of Canada's College of New Scholars, Artists and Scientists.

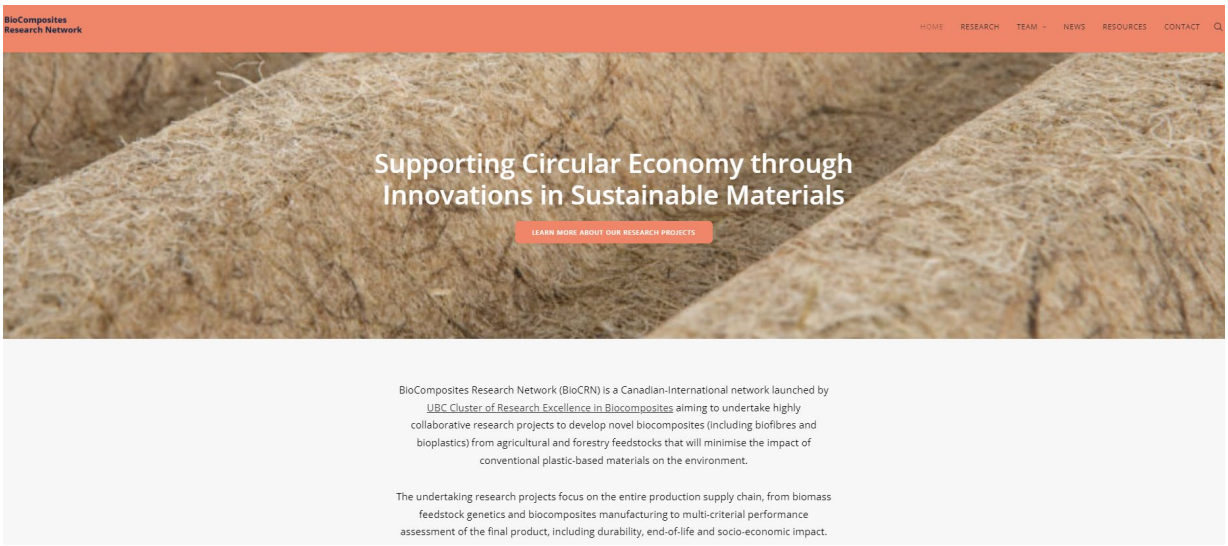
ACTIVITIES AND PROJECTS

Collaborative research programs

Multidisciplinary Undergraduate Research Projects in Health (MURPH): MMRI in collaboration with the Institute for Healthy Living and Chronic Disease Prevention, and Centre for Heart, Lung & Vascular Health runs MURPH which offers a unique cross-disciplinary platform to undergraduate students for engaging in academic research. 9 projects funded by MURPH over 2019-2020 with the involvement of 22 undergraduate students, 18 faculty members, and 2 graduate students (MURPH

2019-2020 MURPH SCHOLARS

BioComposites Research Network (BioCRN): The UBCO Eminence Cluster of Research Excellence in Biocomposites is now transferred into BioComposites Research Network. A website has been created for this initiative, and reach out activities are ongoing to build a strong national and international team under this network.



Technical Assistance to Small and Medium-Sized Companies in British Columbia: MMRI in collaboration with The National Research Council of Canada Industrial Research Assistance Program (NRC IRAP) implemented and managed a financial support program for university-industry projects that are led by UBC researchers and aimed at offering technical assistance in materials and manufacturing to BC-located small and medium-sized enterprises (SMEs). In the first round of the program, 16 projects were completed through this program. Currently, the second round of the program is undergoing through which 15 university-industry projects have so far received financial support from the program.

Circular Economy Seed Funding: MMRI in collaboration with NRC IRAP launched a new funding program in late October 2019 to support joint projects between UBC researchers and BC SMEs in areas related to circular economy. A bi-campus management team for the program has been formed. So far, 11 projects have been funded.

NFRF-Explorations Awarded Smart Manufacturing Initiative: A collaborative project led by Dr. Abbas Milani received funding from NFRF Exploration to develop and test the feasibility of advanced AI-based approaches in actual manufacturing set-ups. In partnership with Kohler Canada and German Aerospace Center (DLR), researchers from the two campuses of UBC along with Monash University are working on this interdisciplinary project.

Event organization

Image Guided Therapeutics: From Conception to Commercialization

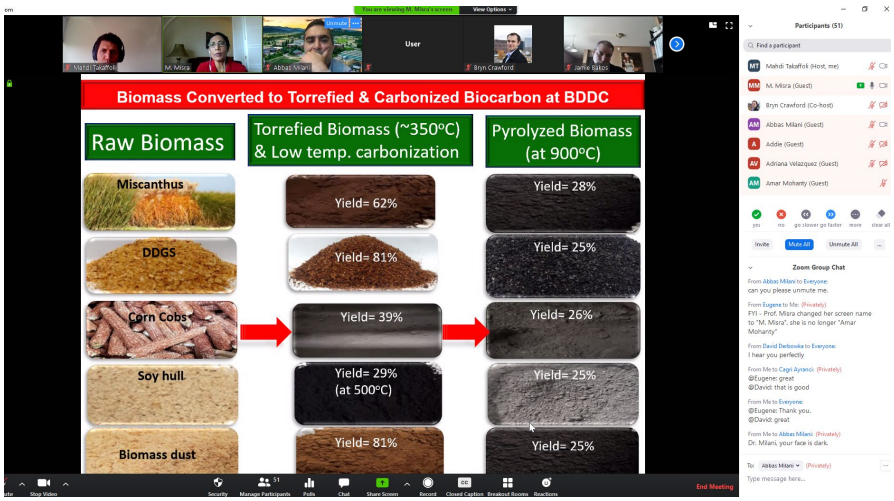
June 25, 2020 | Virtual Event

- 7 talks delivered by directors of academic research institutes involved with medical imaging
- Over 250 attendees
- A panel discussion on "Looking Towards the Future of Image Guided Therapeutics in Canada“
- MMRI co-organized the event.

BioComposites Research Network's Research Day

May 11, 2020 | Virtual event

- Keynote speaker: Prof. Manjusri Misra, University of Guelph
- 19 presentations delivered by graduate students, faculty members and industry associates from Canada, Germany, and India.



Supporting research grant proposals

Grant writing: MMRI continually seeks for opportunities to facilitate and support team-based research grant applications and bring new funding resources for its members. The list below exemplifies some of the major grants that received planning and development support from MMRI staff.

Western Economic Development Funding Program; Platform for Advancing Circular Economy, PACE, in Western Canada (2019) ⧖

- Led by Dr. Abbas Milani (Eng.)
- Requested funding: $500,000 for three years

NSERC Plastic Science for a Cleaner Future; Fate, Transport and Impact of Microplastics Released to the Environment from Wastewater Treatment Plants (LOI, 2020) ⧖

- Led by Dr. Loretta Li (Civil Eng.) in collaboration with 9 faculty members
- Requested funding: $1,000,000 for five years

NSERC CREATE; CREATE Immersive Technologies (LOI, 2020) ⧖

- Led by Dr. Abbas Milani (Eng.) in collaboration with 9 faculty members
- Requested funding: $1,650,000 for six years

NSERC CREATE; Advanced Bio-based Materials (LOI, 2020) ⧖

- Led by Dr. Parisa Mehrkhodavandi (Chemistry) in collaboration with 9 faculty members
- Requested funding: $1,650,000 for six years

MITACS Accelerate; Development of Lignin-based Polymers and Nanomaterials for High Performance Engineering Applications (2019) ✓

- Led by Dr. Parisa Mehrkhodavandi (Chemistry) in collaboration with 5 faculty members
- Requested funding: $140,000 for two years

Goals for next year

- Continue supporting team-based proposals: We will remain committed to support planning, team building and writing multidisciplinary proposals for different funding programs, such as NFRF, CREATE, MITACS, NSERC Alliance, UBC GCRC and UBCO Eminence.
- Focus on building capacity for research and industry support toward circular economy: We aim to expand our current Circular Economy Seed Funding program to a national level so that SMEs and academic researchers across Canada can participate and receive funding.
- Sustaining the MURPH program at UBCO: As the funding support through UBC PURE will end in early 2021, we will look into different internal and external mechanisms to continue running this program at the Okanagan campus.
- Engage in joint international initiatives: Through the BioComposites Research Network, we plan to develop joint initiatives with our partners in Indian Institute of Technology, Roorkee and German Aerospace Centre (DLR) on bio-based materials.

Contact information

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Appendix I: Academic Metrics

Member Name	Faculty	Number of Publications	$ Amt Grant Received	Number of Grad Students Supervised/Co-supervised
Jeffrey Andrews	IKBFOS	3	$90,000	3
Mohammad Arjmand	Applied Science	21	$1,100,000	7
Nemkumar Banthia	Applied Science	32	$3,925,600	12
Joshua Brinkerhoff	Applied Science	5	$1,210,153	19
Joseph Dahmen	SALA	-	-	3
Michael Deyholos	Biology	6	$220,000	5
Cigdem Eskicioglu	Applied Science	16	$3,100,000	7
Fatemeh Fard	IKBFOS	12	$381,240	5
Robert Godin	IKBFOS	6	$450,000	3
Dana Grecov	Applied Science	9	$380,000	10
Warren Hare	IKBFOS	9	$1,000	5
Kasun Hewage	Applied Science	43	$827,500	1
York Hsiang	Medicine	19	-	6
Feng Jiang	Forestry	17	$1,850,000	13
Andrew Jirasek	IKBFOS	9	$40,000	14
Jongho Lee	Applied Science	6	$450,000	6
Isaac Li	IKBFOS	4	$928,000	8
Sunny Li	Applied Science	10	$90,000	4
Jian Liu	Applied Science	21	$814,846	10
Zheng Liu	Applied Science	40	$1,019,932	15

Parisa Mehrkhodavandi	Science	7	$270,000	7
Susan Murch	Science	10	$215,914	4
Abbas Milani	Applied Science	40	$2,300,000	18
Anubhar Pratap-Singh	Land and Food Systems	30	$3,250,000	6
Dimitry Sediako	Applied Science	11	$432,000	7
Rudolf Seethaler	Applied Science	13	$95,000	9
Sumi Siddiqua	Applied Science	17	$1,049,792	
Alexander Uhl	Applied Science	3	$1,200,000	6
Lyndia Wu	Applied Science	6	$190,000	5
Total		382	$25,880,977	208

Appendix II: Grant

Project Title	Funding Body	Amount	Member
Topics in Unsupervised Statistical Learning	NSERC		Jeffrey Andrews (PI)
Advanced Conductive and Magnetic Polymer Nanocomposites as Electromagnetic Shield	NSERC	$600,000	Mohammad Arjmand
Nanomaterials and Polymer Nanocomposites Laboratory	CFI	$160,000	Mohammad Arjmand
Nanomaterials and Polymer Nanocomposites Laboratory	BCKDF	$160,000	Mohammad Arjmand
IC-IMPACTS Canada India Research Center of Excellence (Scientific Director)	NCE		Nemkumar Banthia
Safe, Sustainable and Digitally Monitored Concrete Structures for Smart Cities	NSERC		Nemkumar Banthia (PI)
Performance Eval. & Dev. Corrosion Resistant Multiphase Composite Coatings Protection & Rehab Sewer Pipes	Metro Vancouver		Nemkumar Banthia (PI)
Highly-Fidelity Simulations of Multiphase, Turbulent, and Transitional Flows	Compute Canada	$141,675	Joshua Brinkerhoff (PI)
Translating Shuttle Foil Wind Energy System	DND IDEAS	$198,969	Joshua Brinkerhoff (PI)
Reduced-Order Models of Wind Farm Blockage and Far-Field Wake Recovery	NSERC	$217,968	Joshua Brinkerhoff (PI)
'Topics in unsupervised statistical learning'	NSERC		Jeffrey Andrews (PI)

Pectin-modifying enzymes in plant development and interactions with fungi	NSERC		Michael Deyholos (PI)
Mobile energy efficient tissue culture laboratory for northern agriculture development and crop improvements	MITACS		Michael Deyholos (coPI)
Supra R&D Quantifying the Effects of Stress and Mycorrhizal Relations on the Production of Phytocannabinoids in Rhododendron dauricum and its Fungal Symbiont Albatrellus ovinus.	MITACS		Michael Deyholos (PI)
Laboratory & field scale biodegradability assessment for Pela case products for environmentally end-of-life management.	MITACS	$80,000	Cigdem Eskicioglu (PI)
Advanced resource recovery from wastewater	NSERC	$3,060,300	Cigdem Eskicioglu
Document Understanding	MITACS	$120,000	Fatemeh Fard (PI)
High-throughput linguistic content comparison and sentiment analysis	MITACS	$30,000	Fatemeh Fard (PI)
Automatic Generation of Career Advice Articles	MITACS	$60,000	Fatemeh Fard (PI)
Immersive Technologies	NSERC CREATE	$1,650,000	Fatemeh Fard (CoAppl)
Develop a Sim-to-Real Transfer Learning AI architecture for reliable prediction and optimization of advanced manufacturing processes in the presence of limited data	New Frontiers in Research Fund	$250,000	Fatemeh Fard (Collab)
Urgent upgrade of atomic layer deposition with plasma capability to accelerate energy storage, energy conversion and gas sensing research	NSERC	$114,400	Robert Godin (CoApp)
Infrastructure for Advanced Transient Optical Spectroscopy and Microscopy of Photocatalysts	BCKDF	$320,000	Robert Godin (PI)

Hybrid system for light electrical vehicles controlled by muscle fatigue sensors	MITACS	$30,000	Dana Grecov (PI)
Development of High-Performance Green Cellulose-based Nano Lubricants	KFAS	$28,500	Dana Grecov (PI)
Carbon mitigation in the LNG industry	MITACS	$15,000	Kasun Hewage
Post-occupancy energy planning	NSERC	$50,000	Kasun Hewage
Low impact micro-community development	NSERC	$120,000	Kasun Hewage
Low impact micro-community development	NSERC	$365,000	Kasun Hewage
Low cost water treatment system	IURC	$40,000	Kasun Hewage
Low cost water treatment system	OBWB	$37,500	Kasun Hewage
Performance assessment of water supply systems	NSERC	$307,200	Kasun Hewage
The Comfort-Optimized Materials for Operational Resilience, Thermal-transport, and Survivability	COMFORTS	$1,500,000	Feng Jiang (Co-In)
Enhancing thermal and mechanical performance of engineered wood product adhesives using novel fire retardant nanoclays	BCFII	$60,500	Feng Jiang (PI)
Next generation biobased aerogels and hierarchically structured nanocomposites.	NSERC	$137,471	Feng Jiang (Co-PI)
Developing Next-generation Bio-fabric for Textile Applications	BCMOF	$50,000	Feng Jiang - PI
	BC Cancer Foundation		Andrew Jirasek
The Clean Energy and Water Nanotechnology (CLEAN) Laboratory	CFI John Evans Leaders Fund	$250,000	Jongho Lee – (PI)
Used-Water to Resources (U-WatR)	CFI Innovation Fund	$1,500,000	Jongho Lee – (Co App)

Molecular tools for monitoring and controlling the mechanobiology of diseases	MSFHR	$450,000	Isaac Li
Trojan tag strategy for exosome liquid biopsy	New Frontiers in Research Fund	$250,000	Isaac Lee
Modeling and predicting the thermophysiological comfort of clothing using an advanced multi-sector sweating torso	MITACS	$111,111	Sunny Li (PI)
Safe and Effective Enclosure for Electric Baseboard Heaters	MITACS	$106,667	Sunny Li (PI)
Urgent Upgrade of Atomic Layer Deposition with Plasma Capability to Accelerate Energy Storage, Energy Conversion and Gas Sensing Research	NSERC		Jian Liu (PI)
Graphite/Si Composites for High-Energy Li-ion Batteries	ARC Program		Jian Liu (PI)
Nanoscale surface coating to enable stable and dendrite-free Zn anode for rechargeable aqueous Zn-ion batteries	NSERC		Jian Liu (PI)
Innovative Artificial Intelligence Solutions for Industrial Production (Digital Twin Platform for Infrastructure Asset Lifecycle Management)	Canada-Germany 3+2	$246,600	Zheng Liu (PI)
An integrated System for Gear Condition Monitoring and Predictive Maintenance		$106,666	Zheng Liu (PI)
Development of Lignin-based Polymers and Nanomaterials for High Performance Engineering Applications	MITACS	$147,000	Parisa Mehrkhodavandi (PI)
"One Health" Syst-Omics approach to reduce Campylobacter in agri-food chain	GENOME BC	$500,000	Parisa Mehrkhodavandi (Co-App)
Develop a Sim-to-real Transfer Learning AI architecture for reliable predication and optimization of advanced manufacturing	New Frontiers in Research Fund (Expoloration)	$273,175	Abbas Milani (NPI)

processes in the presence of limited data			
Development of Lignin-based Polymers and Nanomaterials for High Performance Engineering Applications	MITACS	$146,666	Abbas Milani (co-PI)
Modeling and Predicting The Thermophysiological Comfort of Clothing Using an Advanced Multi-Sector Sweating Torso	MITACS	$333,333	Abbas Milani (co-PI)
Development of a Cranberry-Based Food Ingredient" Ocean Spray Cranberries Ltd.	Ocean Spray Cranberries Ltd.		Susan Murch (PI)
ARCTIC Change: Arctic Research and Conservation	NRC		Susan Murch (PI)
Acoustic Force Spectroscopy System	UBCO CRET		Susan Murch (co-App)
Dynamic Light Scattering System	UBCO CRET		Susan Murch (co-App)
Endowed Professorship in Food & Beverage Innovation	Ministry of Agricutlure, Food and Fisheries – Province of BC	$2,750,000	Anubhav Pratap-Singh (Professorship Holder)
Advanced Non-Thermal Food Processing Laboratory	JELF from CFI &BCKDF	$490,000	Anubhav Pratap-Singh (PI)
Microwave- Investigating microwave-dehydration process as a technology to reduce off-flavors during use of plant(pea)-protein isolates	NSERC	$250,000	Anubhav Pratap-Singh (PI)
Development of Novel Aluminum Alloys and MMCs Strengthened with Rare Earth Elements, Nano Ceramic and Carbon Particles	MITACS (ECK INDUSTRIES)	$60,000	Dimitry Sediako (PI)
Development of Al Ce alloys and MMC for automotive engines	MITACS (ECK INDUSTRIES)	$35,000	Dimitry Sediako (PI)
Nemak Global Aluminum Casting and FSW Technologies for Next-Generation Automotive Powertrains	NSERC	$232,000	Dimitry Sediako (PI)
Feasibility Assessment and Development of Knowledge, Technology, and Tools for Reliable	MITACS/FORTIS BC	$75,000	Dimitry Sediako (PI)

Hydrogen Injection into Natural Gas Delivery Systems			
Effect of Hydrogen ingress in X47 pipeline steel/welded joints.	MITACS/FORTIS BC	$30,000	Dimitry Sediako (PI)
Develop a Sim-to-Real Transfer Learning AI architecture for reliable prediction and optimization of advanced manufacturing processes in the presence of limited data	CRCC (NRRF)		Rudolf Seethaler (Co-PI)
Novel sensing and actuating technology for gaseous fuel systems	MITACS		Rudolf Seethaler (PI)
Feasibility study of Biochar Desiccant Sachets	NRC IRAP		Rudolf Seethaler (PI)
Climatic effects and road subgrade stabilization	NSERC DG		Sumi Siddiqua (PI)
Use of pulp mill residues as construction and geotechnical materials	MITACS Elevate		Sumi Siddiqua (PI)
X-ray diffraction (XRD) system	UBCO Cret Program		Sumi Siddiqua (Co-PI)
CO2 Recycling for Carbon-Neutral Solar Fuels	NFRF		Alexander Uhl (PI)
VPRI CRITICAL EQUIPMENT AND INFRASTRUCTURE (CRET), X-ray diffraction (XRD) system	UBCO		Alexander Uhl (PI)
Solution-Processed Thin Film Semiconductors for Photovoltaic and Photoelectrochemical Applications	CFI		Alexander Uhl (PI)
Investigating the Biomechanical Mechanism of Concussions in Sports	MSFHR		Lyndia Wu (PI)
A prospective and longitudinal investigation of concussive and subconcussive mild traumatic brain injury mechanisms in ice hockey	CIHR		Lyndia Wu (PI)
Investigating Brain Trauma Accumulation from Subconcussive Head Impacts and Differences between Male and Female Ice Hockey Players	NFRF		Lyndia Wu (PI)

APPENDIX III: LIST OF SAMPLE PUBLICATIONS

1) Yoo, D.Y., Banthia, N. (2019). Impact Resistance of Fiber-Reinforced Concrete – A Review, Cement and Concrete Composites, Vol. 104, November 2019. doi.org/10.1016/j.cemconcomp.2019.103389.

2) Goffin B., Banthia, N., Yonemitsu, N. (2020). Use of Infrared Thermal Imaging to Detect Corrosion of Epoxy Coated and Uncoated Rebar in Concrete. Construction and Building Materials. Vol. 263. December 2020.120162.

3) Farooq, M., Banthia, N. (2019). FRP fibre-cementitious matrix interfacial bond under time-depended loading. Materials and Structures. Vol. 52, October 2019. DOI: doi.org/10.1617/s11527-019-1409-y.

4) Onuaguluchi, O., Banthia, N. (2020). Alkali-silica reaction resistance of cementitious material containing CaCl2-blended acrylic polymer emulsion. Journal of Materials in Civil Engineering. Vol. 32:3, Feb 2020. DOI: 10.1061/(ASCE)MT.1943-5533.0003049.

5) Moez EK, Hajihosseini M, Andrews JL, and Dinu I (2019). Longitudinal linear combination test for gene set analysis. BMC bioinformatics, 20(1), p.650.

6) Deng X, Ali-Adeeb R, Andrews JL, Shreeves P, Lum JJ, Brolo A, and Jirasek A (2020). Monitor ionizing radiation-induced cellular responses with Raman spectroscopy, non-negative matrix factor- ization, and non-negative least squares. Applied Spectroscopy p.0003702820906221.

7) Culos, A. E., Andrews, J. L., & Afshari, H. (2020). An artificial bee colony algorithm for mixture model-based clustering. Communications in Statistics-Simulation and Computation, 1-12.

8) Dahmen, Joseph, Jens von Bergmann, and Misha Das. (2020). "Teardown Index" in Examining the Environmental Impacts of Materials and Buildings, edited by Blaine Brownell, 64-101. Hershey, Pennsylvania: IGI Global.

9) Kor-Bicakci, G., Abbott, T., Ubay-Cokgor, E., Eskicioglu, C. (2020) Occurrence and fate of antimicrobial triclocarban and its transformation products in municipal sludge during advanced anaerobic digestion using microwave pretreatment. Science of the Total Environment, 705, 135862.

10) Shakourifar, N., Krisa, D., Eskicioglu, C. (2020) Anaerobic co-digestion of municipal waste sludge with grease trap waste mixture: Point of process failure determination. Renewable Energy, 154, 117-127.

11) Cimon, C., Kadota, P., Eskicioglu, C. (2020) Effect of biochar and wood ash amendment on biochemical methane production of wastewater sludge from a temperature phase anaerobic digestion process. Bioresource Technology, 297, 122440.

12) Olaya, W., Dilawar, H., Eskicioglu, C. (2020) Comparative response of thermophilic and mesophilic sludge digesters to zinc oxide nanoparticles. Environmental Science and Pollution Research, available online.

13) X. Peng, U. Anayaoha, Z. Liu, and K. Tsukada (2020) Analysis of magnetic flux leakage (MFL) data for pipeline corrosion assessment, IEEE Transactions on Magnetics, vol.56, no.6, pp.1-15.

14) R. Zhang, Z. Bahrami, T. Wang, and Z. Liu,(2020) An adaptive deep learning framework for shipping container code localization and recognition, IEEE Transactions on Instrumentation and Measurement, vol. 70, pp. 1–15, 2020, Article Sequence Number: 2501013.

15) R. Rayhana, Y. Jiao, A. Zaji, and Z. Liu (2020) Automated vision systems for condition assessment of sewer and water pipelines, IEEE Transactions on Automation Science and Engineering, in press.

16) S. Liu, M. Gao, V. John, Z. Liu, and E. Blasch (2020) Deep learning thermal image translation for night vision perception, ACM Transactions on Intelligent Systems and Technology, vol. 12, no. 1, pp. 1–18

17) B. Mohajer, A. Dey, R. Li (2021) Stagnation Line due to Colliding Wall Jets of Two Liquid Impinging Jets on a Horizontal Surface, Physics of Fluids 33, 047112.

18) X. Gao, Y. Xia, R. Li (2021) Transient boiling of a droplet stream quenching microstructured surfaces, International Journal of Heat and Mass Transfer 164, 120580.

19) X. Gao, R. Li (2019) Experimental and analytical study of transient convection at film flow-wall interface using infrared thermography, International Journal of Thermal Sciences 145, 106023.

20) Y.D. Cao, X. Gao, R. Li (2019) A liquid plug moving in an annular pipe – Heat transfer analysis, International Journal of Heat and Mass Transfer 139, 1065–1076.

21) Sharma, R., Narayan, A., Fard, F. H. (ICMLA 2021), Retrieval Enhanced Ensemble Model Framework For Rumor Detection On Micro-blogging Platforms, Accepted in 20th IEEE International Conference on Machine Learning and Applications.

22) Shahbazi R., Sharma R., and Fard F. H. (2021) API2Com: On the Improvement of Automatically Generated Code Comments Using API Documentations. arXiv preprint arXiv:2103.10668, IEEE/ACM International Conference on Program Comprehension (ICPC) RENE Track.

23) Codabux, Z., Vidoni, M., & Fard, F. H. (2021) Technical Debt in the Peer-Review Documentation of R Packages: a rOpenSci Case Study." arXiv preprint arXiv:2103.09340. Mining Software Repositories (MSR), Accepted. My role was data analysis in this collaboration.

24) Khajezade, M., Ramezani, M., Fard, F. H., Milani, A., Shehata, M. (2021) Toward Using Few-Shot Learning for Prediction of Complex In-Service Defects of Composite Products: A Case Study, Accepted in IEEE Canadian Conference on Electrical and Computer Engineering.

25) Hadi, M. A., & Fard, F. H. (2020) AOBTM: Adaptive Online Biterm Topic Modeling for Version Sensitive Short-texts Analysis, In 2020 IEEE International Conference on Software Maintenance and Evolution (ICSME), IEEE, pp. 593-604.

26) Hadi, M., Fard, F. H., Evaluating Pre-Trained Models for User Feedback Analysis in Software Engineering: A Study on Classification of App-Reviews, Received Continuous Acceptance in Mining Software Repositories, Registered Reports (MSR RR). The MSR RR is peer reviewed and is a pre-acceptance of data and methodology of the study for Empirical Software Engineering journal (EMSE).

27) B. Zakani and D. Grecov (2020) Yield Stress Analysis of Cellulose Nanocrystalline Gels, Cellulose, 27 (16), 9337-9353.

28) C. Feng, Dekun Zhang, D. Grecov and K. Chen (2020) Effect of rheological properties of friction-enhancing greases on the friction between friction lining and wire rope, Tribology International, 144, 106143.

29) H Yeh, O. Barannyk, D. Grecov, and P. Oshkai (2019) The influence of hematocrit on the hemodynamics of artificial heart valve using fluid-structure interaction analysis, Computers in Biology and Medicine,110, 79-92.

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