ENGINEERING:

Centre for Engineering Professional Practice and Engineering Education

Dr. Marcia Friesen
Engineering education, Mobile health applications in computer engineering

Dr. Jillian Seniuk Cicek
Engineering education - scholarship of teaching and learning in engineering education

Civil Engineering

Dr. Marolo Alfaro
Geosynthetic-reinforced earth structures, ground improvement techniques, earthfill dams, northern infrastructure

Dr. Masoud Asadzadeh
Watershed Modeling, Model Calibration, River-Reservoir Systems Modeling, and applications of optimization and sensitivity analysis in water resources engineering

Dr. Mohamed Bassuoni
Infrastructure and building materials, durability of concrete, rehabilitation and sustainable concrete infrastructures

Dr. James Blatz
Geotechnical engineering including design of flood protection infrastructure, infrastructure management and planning

Dr. Young-Jin Cha
Smart sustainable structural systems using advanced structural health monitoring system and control technologies

Dr. Shawn Clark
River ice engineering, ecohydraulics, hydraulic structures

Dr. Karen Dow
River ice engineering, experimental fluid mechanics, computational hydraulics

Dr. Ehab El-Salakawy
Concrete structures, steel and FRP reinforcement, structural behaviour, seismic performance of FRP-RC frames and hollow-core slabs

Dr. Graziano Fiorillo
Bridge engineering, Structural Reliability and Risk, Structural Analysis of Extreme Events

Dr. Beata Gorczyca
Potable water treatment, particle analysis, disinfection, heavy metal removal, water chemistry

Dr. Hartmut Holländer
Hydrogeology, Groundwater Modelling, Hydrology, Geochemistry, Water Science, Environmental Science & Engineering

Dr. Mohamed Issa
Sustainability in Construction, ICT in Construction, Construction Health and Safety Management

Dr. Pooneh Maghoul
Computational Geomechanics, Numerical Modeling, Energy Geo-Structures, Northern Infrastructure, Climate Change, Soil Dynamics

Dr. Babak Mehran
Optimization of traffic operations and public transportation systems, traffic flow modelling, intelligent transportation systems

Dr. Jan Oleszkiewicz
Water pollution control, nitrogen/phosphorus removal, sludge to biosolids, anaerobic treatment, hormone removal

Dr. Jonathan Regehr
Freight transport systems, traffic engineering and modelling, traffic information systems, railroad engineering

Dr. Ahmed Shalaby
Pavement engineering, performance of highway materials, infrastructure engineering and management, design of sustainable infrastructure

Dr. Dagmar Svecova
Precast prestressed concrete bridge deck connections; Use of Ultra-high performance concrete in accelerated bridge construction; durability of concrete under temperature and fatigue loading.

Dr. Qiuyan Yuan
Nutrient removal and recovery, leachate & wastewater treatment, solid waste, biomass, fermentation, anaerobic digestion

Electrical and Computer Engineering

Dr. Udaya Annakkage
Power System Stability, FACTS, HVDC converters, wind energy systems

Dr. Ahmed Ashraf
Information & Computing Systems, Biomedical Engineering

Dr. Faouzi Bellili
Signal Processing and Wireless Communications

Dr. Gregory Bridges
Biomedical and Electrical Biosensors, Sensors, Applied Electromagnetics

Dr. Douglas Buchanan
Micro- Nano-electronic Materials and Devices, MEMs-based ultra-sonic transducers

Dr. Ken Ferens
Telecommunications, Embedded Systems, Distributed Computing

Dr. Shaahin Filizadeh
Power systems transient simulation; power electronics; electric and hybrid vehicles

Dr. Colin Gilmore
Applied Electromagnetics, Electromagnetic Inversion

Dr. Aniruddha Gole
Power systems simulation, flexible AC Transmission systems (FACTS), High Voltage DC Transmission (HVDC)

Dr. Carl Ho
Power Electronics, Energy Efficiency, Renewable Energy Technologies, Smart Grids and Micro Grids

Dr. Ekram Hossain
Wireless communication networks, cognitive radio systesm, multimedia communications over wireless and mobile networks

Dr. Dustin Isleifson
Electromagnetics and Remote Sensing

Dr. Ian Jeffrey
Applied and Computational Mathematics, High Performance Computing, Parallel Programming, Electromagnetics

Dr. Witold Kinsner
Software/hardware computing engines for signal and data compression in cognitive machines and systems

Dr. Behzad Kordi
Condition monitoring of high voltage apparatus, electromagnetic modeling of power transmission lines

Dr. Joe LoVetri
Time domain computational EM, modeling of EMC problems, ground penetrating RADAR, microwave tomography

Dr. Arkady Major
Laser photonics, biophotonics, solid-state lasers

Dr. Bob McLeod
Simulation and Modeling Complex Dynamical and Social Systems, Mobile Game Development

Dr. Dean McNeill
Embedded systems, structural health monitoring, adaptive signal processing, and real-time and ubiquitous computing

Dr. Amine Mezghani
Wireless Communication, Joint Communication and Sensing, Large-Scale Signal Processing, Hardware Constrained Radio, Antenna Theory

Dr. Puyan Mojabi
Applied Electromagnetics

Dr. Zahra Moussavi
Biomedical Engineering, instrumentation, biological signal processing, and rehabilitation

Dr. Vladimir Okhmatovski
Computational Electromagnetics, High Performance Computing, Electronic Design Automation

Dr. Derek Oliver
Assessment of HV insulators, scanning probe microscopy, nanoscale and molecular electronics

Dr. Miloslaw Pawlak
Machine Learning and Pattern Recognition, Statistical Signal Processing

Dr. Athula Rajapakse
Power system protection, monitoring and control, renewable energy integration, active distribution systems and microgrids

Dr. Elham Salimi
Microfluidics, Biosensors, and Bioelectromagnetics

Dr. Cyrus Shafai
Micro/nano-electro-mechanical systems, MEMS, micro-sensors, RF MEMS, MOEMS, adaptive optics

Dr. Sherif Sherif
Optical coherence tomography, optical and fluorescence microscopy, tissue optics, laser spectroscopy

Dr. Gabriel Thomas
Digital Signal and Image Processing. Ultrasound Non Destructive Testing

Dr. Douglas Thomson
Electronic Sensors of Dielectrophoretic actuation, Sensors for Structural Health Monitoring

Dr. Pradeepa Yahampath
Signal Processing and Communications

Mechanical Engineering

Dr. Subramaniam Balakrishnan
Computer Assisted Industrial Engineering, Computer Integrated Manufacturing, Robotics

Dr. Eric Bibeau
Kinetic turbines, biomass, wind turbine icing, plug-in electric vehicles, district Energy Systems

Dr. Madjid Birouk
Combustion of fuels and bio-fuels, fuel nozzles, droplets gasification, swirling flows

Dr. Vijay Chatoorgoon
Aerospace Engineering, Acoustic Wave Propagation, Supercritical Flow Stability

Dr. Chuang Deng
Atomistic modeling and simulations, yielding and plasticity in nanocrystalline materials, grain boundaries

Dr. Philip Ferguson
Satellite, Attitude Control, Navigation, Space Objects, Composites, Reaction Wheels, Drones, Simulation, Orbit Control

Dr. Raghavan Jayaraman
Polymer and Composite Processing, Durability & Interfaces in Polymers and Composites, Novel Composite Materials

Dr. Matt Khoshdarregi
Advanced Manufacturing, Industrial Robotics, Machining, CNC Design, Instrumentation and Mechatronics

Dr. David Kuhn
Multiphase flow in complex geometries, modelling of abdominal aortic aneurysms

Dr. Xihui (Larry) Liang
System Dynamics, Condition Monitoring, Fault Analysis, Reliability, Intelligent Maintenance, Big Data, Machine Learning

Dr. Yunhua Luo
Biomedical Image Construction, Applied Mechanics and Design, Materials Science and Engineering

Dr. Olanrewuju Ojo
Materials Science and Engineering, Processing-Microstructure-Property relationship studies

Dr. Scott Ormiston
Modeling of film condensation, heat exchanger shell-side flows, slab foundation heat loss, microchannels

Dr. Qingjin Peng
Virtual manufacturing, Sustainable product, Modeling and simulation, Product adaptability

Dr. Nariman Sepehri
Teleoperation and Robotics, Control Systems, Systems Modelling and Identification, Actuators and Fluid Power

Dr. Mark Tachie
Experimental Fluid Dynamics, Turbulent Flows Over Rough Surfaces, Laser Doppler Velocimetry, Particle Image Velocimetry

Dr. Igor Telichev
Fracture Mechanics, Nanomechanics and Computational Material Science, Mechanics of Composite Materials

Dr. BingChen Wang
Computational fluid dynamics, turbulent flow, convective heat transfer, bio-fluids, high-performance computing

Dr. Nan Wu
Structural Health Monitoring, Structural Repair and Enhancement, Energy Harvesting, Nano-technology

Dr. Malcolm Xing
Biomaterials, Nanomedicine, Tissue Engineering, 3D Bioprinting, Nanoenergy, Biosensor

Dr. Guozhen Zhu
Material Science and Engineering

Biosystems Engineering

Y. Chen (Ying.Chen@umanitoba.ca)
Research Interests: Soil-tool-material interactions associated with tillage & seeding machines; processing of agricultural fibres.

N. Cicek (Nazim.Cicek@umanitoba.ca)
Research Interests: Treatment of livestock waste, municipal wastewater, and industrial wastewater. Production & utilization of biomass.

C. Erkinbaev (Chyngyz.Erkinbaev@umanitoba.ca)
Research Interests: Smart technologies in food process engineering.

F. Jian (Fuji.Jian@umanitoba.ca)
Research Interests: Studies of insect biology; detection and control of insects & moulds; grain physical properties, grain drying, mathematical modeling of the stored-grain ecosystem.

D. Levin (David.Levin@umanitoba.ca)
Research Interests: Production, properties, and biodegradability of biopolymers, and the manufacture of biodegradable food-packaging materials using biopolymers.

S. Liu (Song.Liu@umanitoba.ca)
Research Interests: Surface engineering of polymeric materials for medical and biomedical applications (surgical drapes, catheters, vascular grafts, ligament & tendon prostheses) to enhance biological interactions.
Potential URA Project: Rechargeable Antiviral Coating

D. Mann (Danny.Mann@umanitoba.ca)
Research Interests: Ergonomics of agricultural guidance systems; remote supervision of autonomous agricultural machines; safety issues associated with agricultural machines.
Potential URA Project: Previous research projects have been completed which have provided compelling evidence that real-time visual information should be incorporated into the design of an automation interface for the task of remotely supervising an autonomous agricultural machine. Anecdotal evidence suggests that real-time auditory information is also used by an operator who is physically present on the agricultural machine. Therefore, it is reasonable to conclude that auditory information might also be a useful addition to an automation interface for the task of remotely supervising an autonomous agricultural machine. Rather than transmitting the sound directly to the automation interface, however, it is envisioned that it would be more efficient to use machine learning techniques to classify sounds present on the operating machine and simply notify the automation interface of any changes in status. Furthermore, it should be possible to adjust the functioning of the machine based on classification of the sounds. The specific project that is envisioned for the summer of 2021 is to prepare instrumentation for collection and classification of sounds from an operating combine harvester. There would be opportunity to participate in data collection when harvest begins in August.

J. Morrison (Jason.Morrison@umanitoba.ca)
Research Interests: Biofibre collection, separation, and grading of all stages using imaging, spectroscopy and mechanical assessment. Material properties assessment of biologically sourced and/or bio-compatible materials.

J. Paliwal (J.Paliwal@umanitoba.ca)
Research Interests: Infrared spectroscopy and electromagnetic imaging (visible, near-infrared hyperspectral, radio frequency, and X-ray) for quality assessment of raw and processed food products.

M. Rahman (Mashiur.Rahman@umanitoba.ca)
Research Interests: Development of natural textile fibres; sustainable textile processing.

R. Sri Ranjan (Sri.Ranjan@umanitoba.ca)

Research Interests: Irrigation; drainage; remediation of contaminated soils & groundwater; instrumentation for soil & water monitoring.

Potential URA Project:

1. Building and optimizing the operation of aeroponic systems for growing herbs/vegetables indoors
2. Evaluating the performance of plant-controlled atmometer for measuring actual evapotranspiration

J. Seniuk Cicek (Jillian.SeniukCicek@umanitoba.ca)

Research Interests: Engineering Education

Engineering education research may be described as a field of study that focuses on the scholarship of teaching and learning in engineering. Researchers employ the theories, frameworks, research methodologies, and practices of the learning and social sciences, for the ultimate purpose of describing and improving the training and education of engineers.

Q. Zhang (Qiang.Zhang@umanitoba.ca)

Research Interests: Airborne disease transmission; air quality in animal facilities; airflow through porous media.

W. Zhong (Wen.Zhong@umanitoba.ca)

Research Interests: Functional electrospun nanofibers for biomedical applications including wound care and tissue engineering.