

## **Professors with research topics that could be of interest to URA students**

### **Biosystems Engineering**

#### **Dr. Ying Chen**

Soil-tool-material interactions associated with tillage & seeding machines; processing of agricultural fibres.

#### **Dr. Nazim Cicek**

Treatment of livestock waste, municipal wastewater, and industrial wastewater. Production & utilization of biomass.

#### **Dr. Chyngyz Erkinbaev**

Smart technologies in food process engineering

#### **Dr. Fuji Jian**

Studies of insect biology; detection and control of insects & moulds; grain physical properties, grain drying, mathematical modeling of the stored-grain ecosystem.

#### **Dr. David Levin**

Dr. Levin's research is focused on biotechnologies for sustainability including biofuels, biodegradable polymers, bioremediation, microbial and enzymatic degradation of synthetic polymers, and microbial production of antioxidants. His research is multidisciplinary integrates microbiology, biotechnology, and genome sciences with bioprocess and biosystems engineering.

#### **Dr. Song Liu**

Surface engineering of polymeric materials for medical and biomedical applications (surgical drapes, catheters, vascular grafts, ligament & tendon prostheses) to enhance biological interactions.

#### **Dr. Danny Mann**

Ergonomics of agricultural guidance systems; remote supervision of autonomous agricultural machines; safety issues associated with agricultural machines.

#### **Dr. Jason Morrison**

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.

#### **Dr. Jitendra Paliwal**

Infrared spectroscopy and electromagnetic imaging (visible, near-infrared hyperspectral, radio frequency, and X-ray) for quality assessment of raw and processed food products.

#### **Dr. Mashiur Rahman**

Development of natural textile fibres; sustainable textile processing.

#### **Dr. R. Sri Ranjan**

Irrigation; drainage; remediation of contaminated soils & groundwater; instrumentation for soil & water monitoring

## **Centre for Engineering Professional Practice and Engineering Education**

### **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. Gursans Guven Isin**

Building information modeling, construction automation and digitalization, construction engineering and project management

**Dr. Ricardo Mantilla**

Hydrologic modeling, flood forecasting, flood frequency estimation, self-similarity in river networks, hydroinformatics, and data assimilation of remote sensing instruments

**Dr. Babak Mehran**

Optimization of traffic operations and public transportation systems, traffic flow modelling, intelligent transportation systems

**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. Chengjin Wang**

Emerging contaminants, water reuse, advanced oxidation processes, natural organic matters, and environmental chemistry

**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 systems, 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. Olanrewaju 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