UNIVERSITY OF TORONTO
FACULTY OF APPLIED SCIENCE & ENGINEERING

The Faculty of Applied Science and Engineering at the University of Toronto is a centre of immense inspiration, remarkable innovation and endless possibilities. Established in 1873, the Engineering Faculty has earned an international reputation for excellence in education and knowledge creation and is known as a forward-thinking resource to address world concerns. With a focus on interactive and collaborative research, the U of T Engineering curriculum reflects global needs in every way. Our graduates are leaders in pinnacle companies across the globe spanning diverse industries and professions. Our students and professors come together to share knowledge and benefit from a progressive environment where great ideas and innovations are born.

Located in the heart of the discovery district in the downtown core of Toronto, Ontario, Canada, the Faculty of Applied Science and Engineering includes approximately 4,500 undergraduate students, 1,500 graduate students, 220 professors and 300 staff in addition to 40,000 alumni.

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Academic Appointments

2008—2009

Anderson, Jason
Bazylak, Aimy
Bazylak, Jason
Enright Jerger, Natalie
Farwell, Jane
Hadjigeorgiou, John
Khisti, Ashish
Kilkenny, Dawn
Lavoie, Philippe
McGuigan, Alison
Nagai, Mary
Nejat, Goldie
Steeves, Craig
Tate, Joseph "Zeb"
Trescases, Olivier

2007—2008

Aleman, Dionne
Andrews, Susan
Ekmekci, Alis
Hofmann, Ron
Kesler, Olivera
Lawryshyn, Yuri
Panesar, Daman
Poon, Joyce
Rocheleau, Jonathan
Stickel, Micah

Jason Anderson

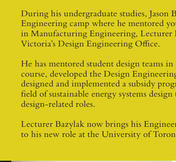
Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

BSc, University of Manitoba, 1995
MASc, University of Toronto, 1997
PhD, University of Toronto, 2005

Jason Anderson's research interests lie in the area of computer hardware design, and specifically on the design and use of Field Programmable Gate Arrays (FPGAs), which are programmable computer chips that can be configured instantly by an end-user to implement any digital circuit. His research is particularly focused on ways to make FPGAs more energy-efficient, have better speed performance, and make them easier to use.

An inventor on 15 U.S. patents, Professor Anderson spent 10 years working in the semiconductor industry in San Jose, California, and Toronto. Previously, he was a Principal Engineer and Manager at Xilinx.

Professor Anderson has received a number of awards and honours, including an NSERC postgraduate scholarship and the Xilinx Ross Freeman Award for Technical Innovation.



Jason Bazylak

Lecturer
Department of Mechanical and Industrial Engineering

BE, University of Saskatchewan, 1999

During his undergraduate studies, Jason Bazylak served as an instructor at an Engineering camp where he mentored young aboriginal students. After working in Manufacturing Engineering, Lecturer Bazylak joined the University of Victoria's Design Engineering Office.

He has mentored student design teams in a Sustainable Energy Systems Design course, developed the Design Engineering Challenge Series for students, and designed and implemented a subsidy program to encourage employers in the field of sustainable energy systems design to hire Engineering intern students for design-related roles.

Lecturer Bazylak now brings his Engineering, education, and design experience to his new role at the University of Toronto.

Mary Nagai

Assistant Professor
Institute of Biomaterials and Biomedical Engineering

BSc, University of Toronto, 1987
PhD, University of Toronto, 1993
MD, University of Toronto, 1998

Mary Nagai is particularly interested in understanding the basic cellular and molecular level changes that take place during spinal cord injury and how these changes can be manipulated to improve the prognosis for patients with spinal cord injury.

Her post-graduate and clinical research studies were undertaken at the University of Manitoba, Alfred I. duPont Hospital for Children, and the University of Toronto.

Professor Nagai will be developing a research program in the area of spinal cord injury, specifically the implementation of a new and unique flexion-distraction spinal cord injury model, which was developed at Alfred I. duPont Hospital for Children.

John Hadjigeorgiou

Professor
Department of Civil Engineering

BASc, University of Ottawa, 1983
Graduate Diploma, McGill, 1985
MEng, McGill, 1987
PhD, McGill, 1993

John Hadjigeorgiou's teaching, research, and consulting activities are in the areas of rock characterization, reinforcement and support, and mine design. With more than 20 years of pertinent experience in Canada, Australia, Africa, and Europe working in mining and Geotechnical Engineering, he joins U of T as the Claudette MacKay Lassonde Chair in Mining Engineering.

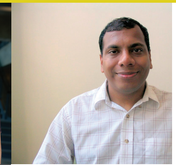
His doctoral thesis, entitled "Integrated Power Supplies for Portable Applications," deals with efficiency optimization techniques and mixed-signal control schemes for embedded low-voltage DC-DC convertors.

Professor Trescases' past research topics include high-efficiency switch-mode power supplies, quasi-resonant DC-DC converters, dynamic voltage/frequency scaling in deep sub-micron VLSI circuits, all-digital class-D audio amplifiers, and motor drives for hybrid electric vehicles.

He has authored several papers in the area of high-efficiency power supplies, for which he received two IEEE best-paper awards in 2003 and 2006.

He has authored and edited books on ground support, surface support in mining and on the challenges in deep and high stress Mining. He has published over 100 technical publications, received the John Franklin Award in Rock Mechanics in 2001 from the Canadian Geotechnical Society, and the Rock Mechanics Award from the Canadian Institute of Mining and Metallurgy in 2007.

Professor Hadjigeorgiou will join U of T in 2009 from Université Laval where he previously served as Head of the Department of Mining, Metallurgical and Materials Engineering.



Ashish Khisti

Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

BASc, University of Toronto, 2002
MS, Massachusetts Institute of Technology, 2004
PhD, Massachusetts Institute of Technology, 2008

Ashish Khisti's research field is in the transmission and security of information and wireless communications and multimedia systems where he uses tools from information and coding theory and statistical signal procession to solve these problems.

His research has examined the role of physical layer in wireless systems for providing confidentiality of information. In the area of multimedia systems, Professor Khisti has used principles of distributed source coding to develop a robust hash function for applications such as secure biometrics and media authentication.

Professor Khisti is the recipient of the Harold L. Hazen Teaching Award and the Joseph Levin Masterworks Award from the Electrical Engineering and Computer Science (EECS) Department at MIT. He has also received a Hewlett-Packard PhD Fellowship, NSERC Fellowship for Postgraduate Studies, and the Lucent Global Science Scholar Award.

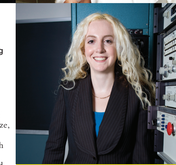
Philippe Lavoie

Assistant Professor
University of Toronto Institute for Aerospace Studies

BSc, Queen's University, 1999
MSc, Queen's University, 2002
PhD, University of Newcastle, 2006

Philippe Lavoie's area of research is flow control and turbulence. The focus of his research is to better understand the fluid flows associated with modern transportation systems, like aircraft, in order to reduce their environmental impact by reducing drag and noise emissions.

Before joining the University of Toronto Institute for Aerospace Studies (UTIAS), Professor Lavoie spent two years working as a Research Associate with the Aeronautics Department at Imperial College in London, England.



Alison McGuigan

Assistant Professor
Department of Chemical Engineering and Applied Chemistry

BEng/MEng, University of Oxford, 2000
PhD, University of Toronto, 2005

Alison McGuigan's research areas of interest are in how to design, organize, and assemble living biological materials such as tissues. Her research combines both Engineering and developmental biology principles and will include the creation of tools and strategies to organize living materials and developing quantitative models to describe the design and assembly process of living materials.

Before joining U of T, Professor McGuigan was a Post-Doctoral Fellow at Harvard University from 2005-2006 and Stanford University from 2006-2008. She was the recipient of a Stanford University Dean's Post-Doctoral Fellowship in 2006-2007.

Goldie Nejat

Assistant Professor
Department of Mechanical and Industrial Engineering

BASc, University of Toronto, 2001
PhD, University of Toronto, 2005

Goldie Nejat's research is in robotics and mechatronics/biomechatronics. Her research focuses on developing intelligent assistive robots and devices to assist humans in dangerous and stressful tasks.

Professor Nejat's highly interdisciplinary research has important applications in the areas of rehabilitation, patient care, search and rescue, emergency response, surveillance, and security and manufacturing.

Her work developing assistive robots for health care applications has been recognized as innovative in the fields of robotics and health/elderly care.

She currently holds an NSERC University Faculty Award, and has also held NSERC fellowships for both her undergraduate and postgraduate studies.

Before joining U of T, Professor Nejat was an Assistant Professor for three years at The State University of New York at Stony Brook.

Craig Steeves

Assistant Professor
University of Toronto Institute for Aerospace Studies

BA, University of Toronto, 1993
BASc, University of British Columbia, 1997
PhD, University of Cambridge, 2002

The principal purpose of Craig Steeves' research is to improve the efficiency and performance of aerospace systems by closely integrating enhanced functionality into lightweight structural systems. His research combines mechanical models of thermostructural behaviours with models of other physical phenomena to achieve optimal component-level designs in a multidimensional and multidisciplinary design space.

After completing his PhD, Professor Steeves joined the Department of Mechanical and Aerospace Engineering's Applied Physics Group at Princeton University where he worked on multifunctional sandwich structures in the context of magnetohydrodynamic power generation on reentering space vehicles.

Professor Steeves joins the University of Toronto in January 2009.

Aimy Bazylak

Assistant Professor
Department of Mechanical and Industrial Engineering

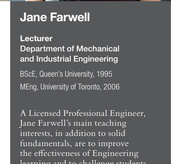
BE, University of Saskatchewan, 2003
MASc, University of Victoria, 2005
PhD, University of Victoria, 2008

Aimy Bazylak's passion for alternative energy led her to join a fuel cell research group at the University of Victoria for her graduate studies. She developed expertise in fuel cell technologies ranging from microfluidic fuel cells to the Polymer Electrolyte Membrane (PEM) fuel cell, a promising technology for a variety of applications from portable electronics to automotives.

During her academic studies, Professor Bazylak received the NSERC undergraduate and postgraduate scholarships.

At the University of Toronto, Professor Bazylak is directing the Microscale Energy Systems Transport Phenomena Laboratory, where her research group is focusing on water management issues facing PEM fuel cell technologies.

She is excited about building an active energy research group at U of T.



Natalie Enright Jerger

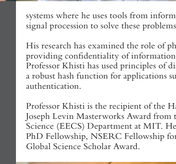
Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

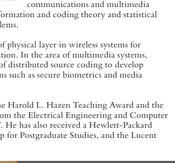
BSc, Purdue University, 2002
MSc, University of Wisconsin – Madison, 2004
PhD, University of Wisconsin – Madison, 2008

Natalie Enright Jerger's research focuses on computer architectures, specifically ways in which to optimize communication between processing cores and memory.

She's also interested in exploring the impact of new technologies on computer architectures, including carbon nanotubes, on-chip optics, and three-dimensional die stacking.

Professor Enright Jerger will join The Edward S. Rogers Sr. Department of Electrical and Computer Engineering in January 2009.





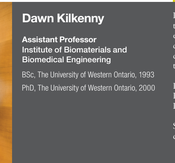
Jane Farwell

Lecturer
Department of Mechanical and Industrial Engineering

BScE, Queen's University, 1995
MEng, University of Toronto, 2006

A Licensed Professional Engineer, Jane Farwell's main teaching interests, in addition to solid fundamentals, are to improve the effectiveness of Engineering learning and to challenge students to develop practical thinking skills. Drawing from a variety of fields, including business, marketing, politics, healthcare, and Engineering, she achieves this goal by providing students with practical applications of the concepts taught.

In addition to her teaching in Engineering and technology, Lecturer Farwell brings industrial work experience in design Engineering, manufacturing management, and Six Sigma quality.



Dawn Kilkenny

Assistant Professor
Institute of Biomaterials and Biomedical Engineering

BSc, The University of Western Ontario, 1993
PhD, The University of Western Ontario, 2000

Dawn Kilkenny's research interest is fibroblast growth factors (FGFs) and signaling through FGF receptors. Specific interests relate to cellular interaction with the extracellular environment and changes in FGF receptor signaling, particularly during migration. The dynamics of receptor trafficking to varying subcellular compartments within the cell are also examined using live cell fluorescent imaging techniques.

Prior to joining the Institute of Biomaterials and Biomedical Engineering (IBBME), Professor Kilkenny was a Senior Research Specialist at the Cell Imaging Shared Resource at Vanderbilt University in Nashville, Tennessee.

She gained significant experience in confocal and fluorescent imaging techniques during her tenure at this microscopy facility.

Joseph "Zeb" Tate

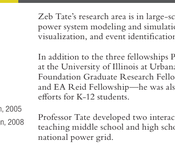
Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

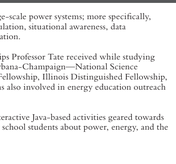
BS, Louisiana Tech University, 2003
MS, University of Illinois at Urbana-Champaign, 2005
PhD, University of Illinois at Urbana-Champaign, 2008

Zeb Tate's research area is in large-scale power systems; more specifically, power system modeling and simulation, situational awareness, data visualization, and event identification.

In addition to the three fellowships Professor Tate received while studying at the University of Illinois at Urbana-Champaign—National Science Foundation Graduate Research Fellowship, Illinois Distinguished Fellowship, and EA Reid Fellowship—he was also involved in energy education outreach efforts for K-12 students.

Professor Tate developed two interactive Java-based activities geared towards teaching middle school and high school students about power, energy, and the national power grid.



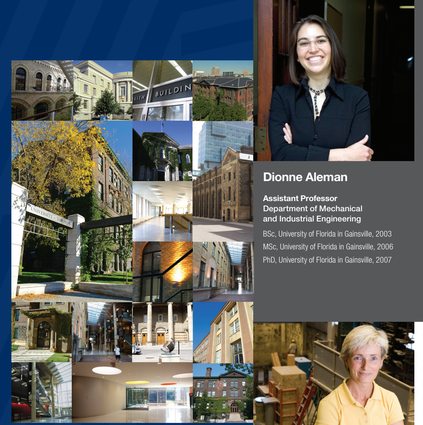


Olivier Trescases

Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

BASc, University of Toronto, 2002
MASc, University of Toronto, 2004
PhD, University of Toronto, 2007

Olivier Trescases is currently working in Austria with the concept-development team at Infineon, where he is developing flexible power management strategies for automotive integrated circuits.



Dionne Aleman

Assistant Professor
Department of Mechanical and Industrial Engineering

BSc, University of Florida in Gainsville, 2003
MSc, University of Florida in Gainsville, 2006
PhD, University of Florida in Gainsville, 2007

Dionne Aleman is interested in applying operations research techniques to the fields of healthcare delivery and medical procedures. Her primary research area focuses on developing new models and algorithms to solve problems arising in intensity-modulated radiation therapy (IMRT) treatment planning, which she is currently extending to total body irradiation treatments.

Professor Aleman is also using contact networks, homogeneous mixing models, percolation theory, and Geographical Information Systems (GIS) to model the spread of disease during an epidemic. Another current project involves scheduling elective surgeries under deadlines and emergency surgery disruptions.

Her research collaborators include doctors and administrators from Princess Margaret Hospital, Toronto General Hospital, Emergency Management Ontario, and the Emergency Management Unit of the Ministry of Health and Long-Term Care.

Susan Andrews

Associate Professor
Department of Civil Engineering

BSc, University of Alberta, 1982
MSc, University of Alberta, 1985
PhD, University of Alberta, 1993

Susan Andrews' research is concerned with the optimization of water treatment processes, especially in the area of drinking water disinfection.

The balance between inactivating pathogens and minimizing the formation of chemical by-products is of particular concern, with a focus to evaluating a variety of disinfection technologies including light (ultraviolet, solar) as an alternative to traditional chemical disinfectants (chlorine).

Professor Andrews is currently a Program Leader for the Canadian Water Network, and she has held leadership positions in several professional organizations, such as: Chair of the Ontario Water Works Association and the Director of the Walkerton Clean Water Centre.

Prior to joining the University of Toronto, Professor Andrews was an Associate Professor at the University of Waterloo, where she she had also been Chair of the Environmental Engineering Program Board.

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Office of the Dean
35 St. George Street
Galbraith Building
Toronto, Ontario
M5S 1A4 Canada

dean@ecf.utoronto.ca
www.engineering.utoronto.ca

Alis Ekmekci

Assistant Professor
University of Toronto Institute for Aerospace Studies

BS, Istanbul Technical University, 2000
MS, Lehigh University, 2003
PhD, Lehigh University, 2006

Alis Ekmekci's research interests include experimental studies of flow-structure interactions, unsteady separated flows, control of flow for the reduction of drag and suppression of flow-induced vibration, low Reynolds number aerodynamics, and flow visualization.

One of her current projects involves exploration of means to manipulate flow to suppress its unwanted effects on bluff cylindrical structures, which will help designers of offshore oil rigs to control flow induced vibrations.

Prior to joining U of T, Professor Ekmekci spent a Post-Doctoral year at Purdue University. She is currently setting up an experimental fluids research laboratory at UTIAS with world-class facilities that will lead to a capacity to conduct several experimental projects in the area of fluid dynamics.

Ron Hofmann

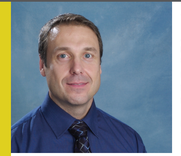
Assistant Professor
Department of Civil Engineering

BEng, Concordia, 1993
PhD, University of Toronto, 2003

Ron Hofmann's research identifies chemicals and microorganisms in drinking water that make people ill, and then work to build the best tools to solve the problem.

In Canada, and in other developed countries where drinking water quality is already very good, the research often focuses on identifying new and emerging health risks from micro-contaminants such as algal toxins. In developing countries, the greatest threats are usually well-known, such as arsenic and E. coli; however, the challenge lies in how to deliver treatment methods where there is a poor understanding of hygiene and little money.

Through collaboration with industrial sponsors, different levels of government, and partnerships with scholars at universities around the world, Professor Hofmann is helping to build a major research centre at the University of Toronto that will make the world's drinking water safer.



Yuri Lawryshyn

Assistant Professor
Department of Chemical Engineering and Applied Chemistry

BASc, University of Toronto, 1989
MASc, University of Toronto, 1993
MBA, Richard Ivey School of Business, The University of Western Ontario, 2002
FinEng-Dipl. Schulich School of Business, York University, 2007
PhD, University of Toronto, 1997

Yuri Lawryshyn's areas of interest include: business process optimization, financial Engineering, asset management in the municipal environmental sector, and environmental research.

He applies Engineering principles, with an emphasis on numerical methods, to optimize business processes in the financial sector. He also applies Financial Engineering real options theory to improve financial decision making, with an emphasis on the municipal environmental sector.

Professor Lawryshyn has worked in a number of industries applying computational fluid dynamics (CFD) for R&D, and later performing financial analysis. In 1998, he joined Trojan Technologies where developed a new theory for UV reactor performance, led the development of an award-winning UV reactor for municipal water treatment, Before taking on managerial roles at an international level. Before joining U of T, he worked with the BMO Market Risk Modeling Group.

Olivera Kesler

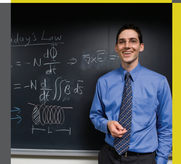
Assistant Professor
Department of Mechanical and Industrial Engineering

BSE, University of Pennsylvania, 1994
SM, Massachusetts Institute of Technology, 1997
ScD, Massachusetts Institute of Technology, 1999

Olivera Kesler's research focuses on developing reliable fuel cells that are durable, cost-effective, and utilize a wider variety of fuels.

Professor Kesler's research will help create a fuel cell that will reduce greenhouse gas emissions, air pollution, and health care costs. Her research focus is on solid oxide fuel cells that can run on both traditional and renewable fuels, such as hydrogen, biogas, and ethanol.

Professor Kesler was recently awarded a Canada Research Chair in Fuel Cell Materials and Manufacturing from the Government of Canada. Additionally, she has received an NSERC Discovery Accelerator Supplement and an Ontario Early Researcher Award. Prior to joining the University of Toronto, Professor Kesler was an Assistant Professor at the University of British Columbia.



Daman Panesar

Assistant Professor
Department of Civil Engineering

BE. McMaster University, 1995
MESc. The University of Western Ontario, 1997
PhD. McMaster University, 2007

Daman Panesar's research interests lie in the study of cement and concrete materials; hydration kinetics; evolution of microstructural, mechanical and transport properties of concrete; the effect of exposure conditions on material microstructure; degradation mechanisms and indicators for concrete durability; durable and sustainable cement-based materials; supplementary cementitious materials; service life estimates; and life cycle cost assessment, green building materials, non-destructive evaluation and testing of concrete.

Before joining the Department of Civil Engineering at the University of Toronto in January 2008, Professor Panesar worked in industry at Atomic Energy of Canada Limited, where she was involved with various projects that focused on design, construction and commissioning, plant life management and service life prediction of nuclear-related concrete structures, evaluation and repair of containment facilities, and radioactive waste management.

Professor Panesar is the recipient of an NSERC Industrial Postgraduate Award.

Jonathan Rocheleau

Assistant Professor
Institute of Biomaterials and Biomedical Engineering

BSc, University of Windsor, 1994
PhD, The University of Western Ontario, 2000

Jonathan Rocheleau's lab uses a number of cutting-edge techniques to examine ß-cell–vascular endothelial cell interaction: two-photon excitation microscopy, confocal microcopy, microfluidics, and live cell imaging of fluorescent proteins.

Professor Rocheleau's current projects use cell culture and ex vivo pancreatic islet models. These studies will advance the understanding of pancreatic islet communication, with a specific focus on the communication between ß-cell and vascular endothelial cells through FGF/FGFR1-signaling.

Prior to joining the University of Toronto, Professor Rocheleau was a Research Assistant Professor in Molecular Physiology and Biophysics at Vanderbilt University, in Nashville, Tennessee.

Micah Stickel

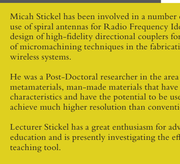
Lecturer
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

BSc, University of Toronto 1997
MSc, University of Toronto, 1999
PhD, University of Toronto, 2006

Micah Stickel has been involved in a number of research projects, including the use of spiral antennas for Radio Frequency Identification (RFID) systems, the design of high-fidelity directional couplers for digital circuits, and the application of micromachining techniques in the fabrication of bandpass filters for broadband wireless systems.

He was a Post-Doctoral researcher in the area of three-dimensional metamaterials, man-made materials that have unusual electromagnetic characteristics and have the potential to be used in imaging systems that can achieve much higher resolution than conventional lens-based approaches.

Lecturer Stickel has a great enthusiasm for advancing the art of Engineering education and is presently investigating the effectiveness of the Tablet PC as a teaching tool.



Joyce Poon

Assistant Professor
The Edward S. Rogers Sr. Department of Electrical and Computer Engineering

BASc, University of Toronto, 2002
MS, California Institute of Technology, 2003
PhD, California Institute of Technology, 2007

Joyce Poon's research interests are in theory, design, fabrication, and characterization of micro- and nano-scale photonic devices.

Her current focus is on active optical microresonators for ultra-compact, low-power, and high-speed optoelectronic circuits.

The work has potential applications for exascale computing systems and data communications.

Her most significant research contributions have been to the field of coupled optical micro-resonators, particularly the slow-wave propagation in coupled resonator waveguides.

Professor Poon currently holds an NSERC University Faculty Award. She was the recipient of the Milton and Francis Clauser Doctoral Prize, IEEE-LEOS Graduate Student Fellowship, OSA Dekker Graduate Student Award, and the NSERC PGS-D and Julie Payette PGS-A fellowships.

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Academic Appointments