





























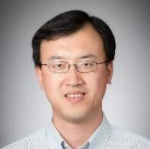
# DEPARTMENT OF MECHANICAL ENGINEERING

## FACULTY RESEARCH INTERESTS

NAME	RESEARCH INTERESTS
<b>AHMED, Ryan</b> 	Artificial Intelligence; Machine and Deep Learning; Autonomous Vehicles; Electric and Hybrid Powertrains; Electrified Vehicles; Renewable and Efficient Energy Systems; Energy and Sustainability
<b>ARAMESH, Maryam</b> 	Clean Manufacturing, surface engineering, machining of difficult to cut materials, development of novel coating methods for cutting tools, development of a new class of lubricants for machining of difficult to cut materials
<b>BONE, Gary M.</b> 	Robot design, sensing and control; Collaborative robots (Cobots); 3D machine vision for robots; Robot learning from demonstration; Soft pneumatic actuators; Hybrid pneumatic-electric actuators; Advanced control algorithms for pneumatic and hybrid actuators
<b>CHING, Chan Y.</b> 	Thermal management, heat pipes, electronics cooling. Heat and mass transfer. Electrohydrodynamics.
<b>COTTON, James S.</b> 	Community Energy Systems, Distributed Energy Resources, Waste Energy Recovery, Automotive Thermal Management, Integrated Energy Systems, Electrohydrodynamics, Energy Harvesting, Heat Exchanger Design, Heat Transfer, Thermal Management, Thermal Storage, Thermal System Control, Two-Phase Flow
<b>DIDAR, Tohid</b> 	Nanobiomaterials for diagnostics, therapeutics and public health. Biomaterials, Hydrogels, Biosensing, Organs-on-Chips <a href="https://didarlab.ca/">https://didarlab.ca/</a>

<b>ELBESTAWI, Mo</b>		Metal Additive manufacturing, Hybrid manufacturing (additive/subtractive), Application of Machine learning in quality control of additive manufacturing processes ( sensors, defect detection and process control)
<b>EMADI, Ali</b>		Electric Vehicles; Autonomous Vehicles; Electrified Powertrains; Transportation Electrification and Smart Mobility; Power Electronics; Electric Machines; Electric Motor Drives; Energy Management Systems; and Artificial Intelligence and Machine Learning for Smart Mobility. <a href="https://electrification.mcmaster.ca">https://electrification.mcmaster.ca</a>
<b>GADSDEN, S. Andrew</b>		Control and estimation theory, artificial intelligence and machine learning, and smart or cognitive systems. Applied research includes: mechatronic and aerospace systems, condition monitoring, data science, and fault detection and diagnosis. Projects and other areas include: aerospace and space systems, autonomous systems, mechatronics and robotics, smart or cognitive systems. <a href="http://ice.mcmaster.ca">http://ice.mcmaster.ca</a>
<b>HABIBI, Saeid</b>		Testing, characterization and modeling of batteries. The models of interest include: equivalent circuit, electrochemical, impedance, and thermal.
<b>HAMED, Mohamed</b>		Transport phenomena (momentum, heat and mass transfer) in thermal engineering systems, development of enabling technologies for lightweight materials. <a href="http://mechfaculty.mcmaster.ca/~hamedm/index.htm">http://mechfaculty.mcmaster.ca/~hamedm/index.htm</a>
<b>JAIN, Mukesh</b>		Multi-scale microstructure-based modeling of deformation behavior of materials.
<b>KOSHY, Phil</b>		Machining: cutting, grinding, and electric discharge machining (EDM) processes. Additive Manufacturing
<b>LIGHTSTONE, Marilyn</b>		CFD, thermal fluids systems, solar thermal energy, geothermal energy, energy storage, turbulence modelling, particle laden flows
<b>MORTON, Christopher</b>		Experimental and computational fluid mechanics, flow-induced vibrations, unsteady aerodynamics, advanced sensing, sensor-based flow and force estimation, active and passive flow control, application of artificial neural networks and machine learning in experimental aerodynamics.

<b>MOTAMED, Zahra</b>		Cardiovascular engineering and mechanics, biofluid mechanics, medical imaging, cardiovascular solid mechanics and structure, diagnostics and monitoring
<b>NG, Eu-Genie</b>		Numerical Modelling of Material Microstructural effects on Mechanical Behavior, Solid Mechanics of Structures under Multi-axis Loading, Mechanics of Thermal and Mechanical Loadings on Residual Stresses, Design and Manufacture of Carbon Fiber Reinforced Plastic.
<b>QUENNEVILLE, Cheryl</b>		Biomechanics: injury risk, impact testing, fracture, crash test dummies, finite element models for injury prediction, use of medical images to predict fracture risk in osteoporosis <a href="http://www.macinjurybiomech.com">www.macinjurybiomech.com</a>
<b>SALAUDEEN, Shakirudeen A.</b>		Biomass conversion, waste valorization, bioenergy and biofuels, renewable hydrogen, decarbonization, biomaterials, carbon capture and utilization.
<b>SELVAGANAPATHY, P. Ravi</b>		Micro/Nanofabrication, Micro/nanofluidics, Additive Manufacturing, Artificial Organs, Tissue Engineering, Lab on chip devices, diagnostics, drug delivery, drug discovery, Cultured Meat, Filtration and Protective Equipment.
<b>SHANKAR, Sumanth</b>		Automotive lightweighting, aluminium alloy development for structural cast components, development of casting technologies for automotive structural castings, materials science and engineering, physical metallurgy, transport phenomena.
<b>TROWELL, Keena</b>		Metal-water reactions, supercritical water oxidation, power-to-X, circular fuels, energy storage, hydrogen energy
<b>TULLIS, Stephen</b>		Computational and experimental fluid mechanics with and without chemical reactions/combustion with applications in nuclear reactor flows, liquid metals (e.g. extractive metallurgy, steel making). Fluid mechanics / hydrodynamics / aerodynamics in sports, particularly rowing, canoe, kayak and sailing (experimental and instrumentation, and computational).
<b>VELDHUIS, Stephen C.</b>		High-performance manufacturing targeting tooling improvements, process development/optimization strategies, condition-based monitoring and process performance assessment strategies. Research activity leverages materials characterization and property assessment tools, experimental studies augmented with sensors, data collection, 5G mm Wave communications, and advanced analytics involving AI/ML. <a href="http://mmri.mcmaster.ca/">http://mmri.mcmaster.ca/</a>

<p><b>WOHL</b>, Gregory R.</p>		<p>Biomechanics: tissue mechanical properties; bone interaction with implants; electrical stimulation of bone in healing and adaptation; development and testing of physical models for surgical training</p>
<p><b>WU</b>, Peidong</p>		<p>Constitutive Modelling of Large Inelastic Deformation of Engineering Materials Including Polymers and Metals.</p>
<p><b>YAN</b>, Fengjun</p>		<p>Advanced Control and Estimation; Hybrid Electric Powertrain; Autonomous driving; Electric Vehicle; Artificial Intelligence in Automotive Control</p>



Department of Mechanical Engineering

