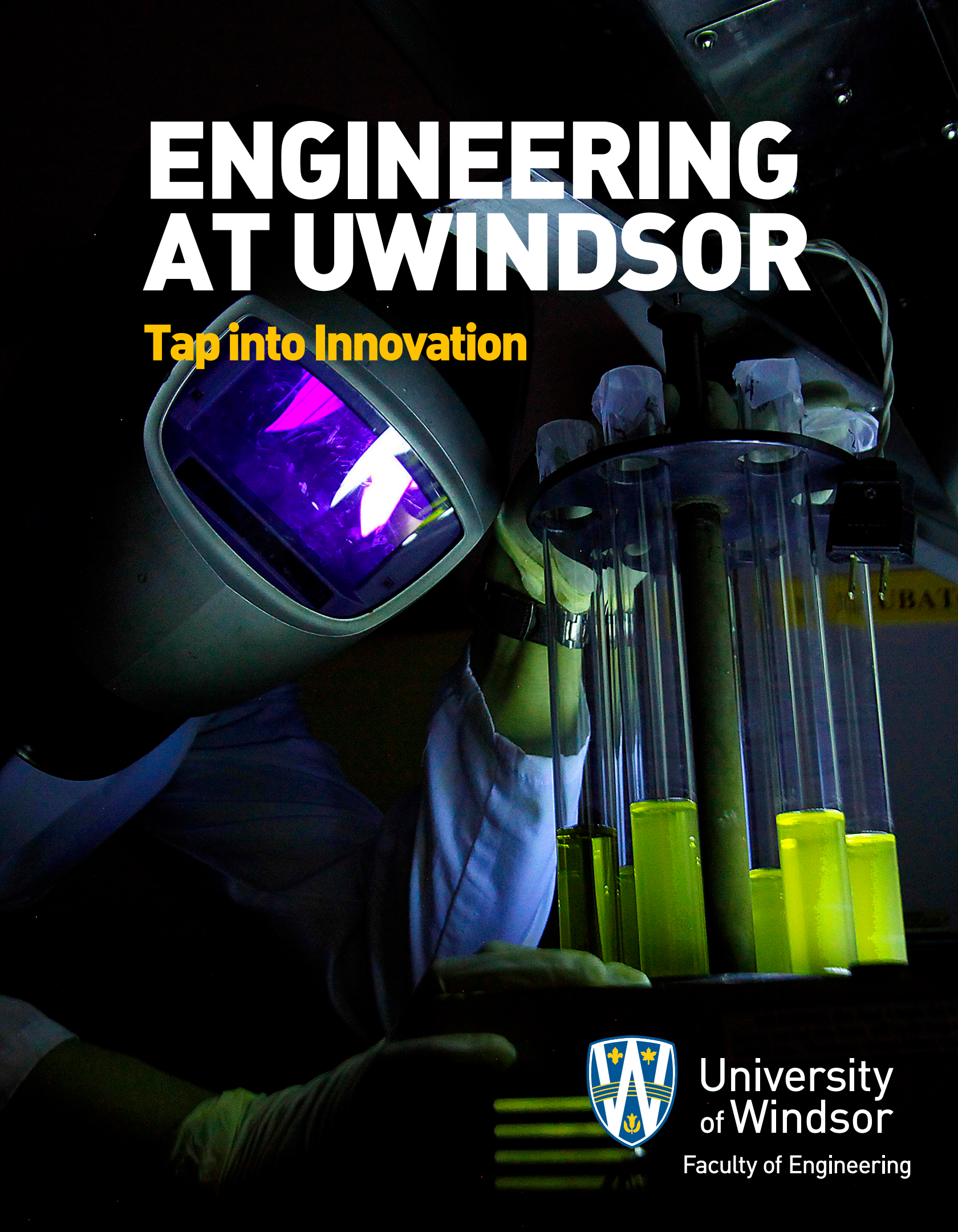


ENGINEERING AT UWINDSOR

Tap into Innovation

University of Windsor

Faculty of Engineering

ENGINEERING AT UWINDSOR

Civil and Environmental Engineering Department

DR. ABDUL-FATTAH ASFOUR

Professor

- Transport processes in non-electrolyte solutions in membranes
- Viscometric properties of lubricating oil

asfour@uwindsor.ca
519-253-3000, Ext. 2514

DR. RAM BALACHANDAR

Professor

- Fluid-structure interaction, sprays
- Scour and sediment transport, hydraulic structures
- Mixing, jets, wall jets
- Fluid flow with heat transfer

rambala@uwindsor.ca
519-253-3000, Ext. 3563

Computational Fluid Mechanics Laboratory
Hydraulic Engineering Laboratory
Sedimentation and Scour Laboratory

- Laser based velocity measurement
- Water tunnel and open channel flumes
- Computational fluid dynamics
- Experimental fluid mechanics

DR. NIHARENDU BISWAS

Professor

- Water quality, drinking water disinfection
- Land treatment of wastewater
- Hazardous waste treatment
- Water and wastewater in developing countries

biswas@uwindsor.ca
519-253-3000, Ext. 2693

DR. TIRUPATI BOLISETTI

Associate Professor

- Hydrology and climate change impact assessment and adaptation
- Geothermal energy
- Evaporation from porous surfaces
- Grouting, scour

tirupati@uwindsor.ca
519-253 3000, Ext. 2548

DR. RUPP CARRIVEAU

Professor
Director of Environmental Energy Institute
Director of Turbulence and Energy Laboratory

- Terrestrial and offshore energy systems
- Energy storage
- Systems optimization
- Emerging agricultural practice

519-253-3000, Ext. 2638
rupp@uwindsor.ca

Environmental Energy Institute

- Energy analytics
- Energy policy development
- Energy training

Turbulence and Energy Lab

- Closed loop wind tunnel
- 10,000 gallon offshore testing tank
- Heat exchanger test rig

environmentalenergyinstitute.com
turbulenceandenergylab.org
osessociety.com

DR. SHAOHONG CHENG

Professor

- Dynamics of structures
- Vibration and control
- Engineering application of advanced material
- Wind-induced response of structures and bluff body aerodynamics

shaohong@uwindsor.ca
519-253-3000, Ext. 2629

Boundary Layer Wind Tunnel Lab

- Open-loop boundary layer wind tunnel lab (study wind-related structural and environmental problems)
- Vibration control
- Application of advanced materials

DR. SREEKANTA DAS

Professor

- Behaviour of masonry structures
- Structural and fatigue behaviour of steel pipelines
- Repair of corroded and damaged steel and concrete structures
- Application of special fibres and fibre composite in concrete and steel structures

sdas@uwindsor.ca
519-253-3000, Ext. 2507

Structural Engineering Testing Lab

- 680 m2 strong floor area with two 5m wide and 11m tall concrete strong walls with a high capacity MTS loading actuator for application of lateral load on wall specimens up to 10m tall
- Two large (500 kN and 250 kN) capacities fatigue loading frames and one small (100 kN) fatigue loading frame
- High capacity (up to 3000 kN) cyclic loading frame
- Capacity to apply pressure load up to 3000 psi
- Test frame for application of axial load along with uni-axial or bi-axial bending moments

---

DR. FAOUZI GHRIB

Professor

- Numerical simulation of piezoelectric materials
- Damage assessment of quasi-brittle materials (ceramics, concrete, etc.)
- Numerical simulation of fatigue process under multi-axial loading stress
- Seismic analysis of large structures (dams, bridges, etc.)

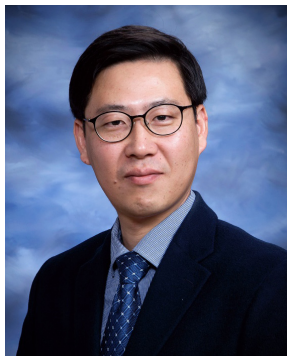
fghrib@uwindsor.ca
519-253-3000, Ext. 2550

DR. PAUL HENSHAW

Head, Civil and Environmental Engineering Department
Associate Professor

- Solar energy
- Automotive coatings application
- Greenhouse modelling

henshaw@uwindsor.ca
519-253-3000, Ext. 2588



DR. YONG HOON KIM

Assistant Professor

- Connected and Autonomous vehicles (CAVs), Intelligent Transportation Systems (ITS), advanced traveler information systems
- Advanced driver assistance systems
- Transportation system analysis and modeling
- Traffic flow modeling and simulation

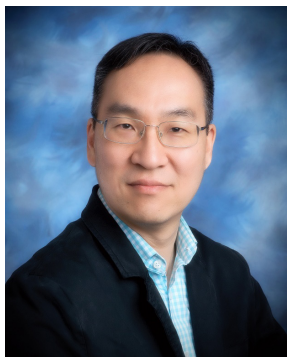
kim523@uwindsor.ca
519-253-3000, Ext. 2536

DR. JERALD LALMAN

Professor

- Waste to energy, food processing, municipal wastewater and water treatment
- Microbial destruction, petrochemical, fine chemicals and pulp and paper industries

lalman@uwindsor.ca
519-253-3000, Ext. 2519



DR. CHRIS LEE

Associate Professor

- Traffic operation and control
- Traffic safety and driver behaviour
- Intelligent transportation systems
- Highway design

cclee@uwindsor.ca
519-253-3000, Ext. 2544

Transportation Systems Innovation (TSI) Lab

- Driving simulator (observe drive behaviour in various virtual traffic, road geometry and environmental conditions, and collect detailed driver maneuver data such as speed, acceleration, spacing, pedal position, etc.)
- Radar detectors and bluetooth data collectors (collect traffic counts and speed at fixed locations and estimate travel time)
- High-end computer facilities (perform analysis of large-scale traffic and crash data using statistical analysis and traffic simulation software)

DR. HANNA MAOH

Associate Professor

- Integrated transportation and land-use models
- Freight transportation analysis, travel demand modelling and forecasting
- GIS and big-data analysis, environmental impacts of transportation, sustainable transportation
- Micro-simulation methods and models in land use and transportation

maohhf@uwindsor.ca
519-253-3000, Ext. 4987
cbinstitute.ca/traffic-lab-general-information

Cross-Border Institute Traffic Lab

- Features LED Panasonic panels to display and analyze traffic in real time and RTMS radar sensors to detect and record border traffic in the Windsor region
- Fibre network connection with a powerful server and data storage array to enable the execution of computationally intensive traffic simulations and the storage of big data in timely fashion
- Up-to-date specialized software including, but not limited to, EMME 4.0.1, VISSIM 6.0 and ArcGIS 10.2 to promote cutting-edge transportation research

Transportation Systems Innovation Lab

- Eight professional LCD TVs to display and analyze traffic in real time
- Twelve high-end computers to accommodate 12 researchers at any given time
- A powerful, 16-core Dell server for software sharing and data storage, two high-end Intel Xeon workstations to run intensive simulations and HP large-format scanner and printer
- A partial-cab, research-driving simulator to observe driver behaviour under various driving and traffic conditions

DR. RAJEEV RUPARATHNA
Assistant Professor

- Infrastructure lifecycle management using building information modelling (BIM) tructural control
- Lifecycle assessment of engineering systems
- Multi stakeholder management in Sustainable procurement
- Risk based decision making

Rajeev.ruparathna@uwindsor.ca
519-253-3000, Ext. 5433

DR. RAJESH SETH
Professor

- Water and wastewater treatment
- Ozonation and advanced oxidation processes
- Microbial contamination and remediation
- Contaminant fate during sewage treatment process - monitoring/modelling/removal

rseth@uwindsor.ca
519-253-3000, Ext. 2553

Water/Wastewater Lab
- Batch/continuous flow experimentation
- Traditional and advanced water/wastewater analysis; Biohazard Safety Level 2 certified laboratory
- Instruments available include: UV-Vis Spectrophotometer; TOC/BOD/COD Analyzers; Atomic Absorption Spectrophotometer; Gas Chromatograph; High Performance Liquid Chromatograph; Ion Chromatograph

DR. EDWIN TAM
Associate Professor

- Sustainability and resiliency in infrastructure systems and engineering
- Materials end-of-life waste management and recovery/vehicle recycling
- Brownfields renewal and redevelopment
- Life cycle assessment and approaches

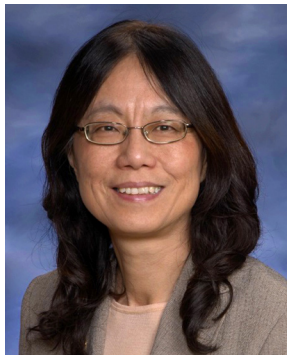
edwintam@uwindsor.ca
519-253-3000, Ext. 2561

Materials Sustainability and Waste Management Lab
- Materials end-of-life classification
- Dismantling and size reduction
- Recycling feasibility investigations and assessment

DR. NIEL VAN ENGELEN
Assistant Professor

- Structural control
- Seismic and vibration isolation
- Pedestrian-induced vibrations
- Dynamic vibration absorbers

niel.vanengelen@uwindsor.ca
519-253-3000, Ext. 2509



DR. IRIS XU
Professor

- Air quality monitoring and modelling
- Exposure assessment
- Emission control
- Measurement and parameterization of air-surface exchange of air pollutant

xxu@uwindsor.ca
519-253-3000, Ext. 2511

Air Quality Lab
- Monitoring equipment of mercury, particulate matter (PM), ozone, CO, SO2, NOx & ultra-fine particles

ENGINEERING AT UWINDSOR

Electrical and Computer Engineering Department

DR. MAHER ABDELKHALEK

Assistant Professor

- Modeling, analysis and control of power-electronic converters and their applications in grid integration of wind and solar farms
- Operation and control of active distribution networks
- Protection of power systems with renewable energy sources
- Power flow studies and energy management of hybrid ac/dc microgrids

mazzouz@uwindsor.ca
519-253-3000, Ext. 5432

DR. ESAM ABDEL-RAHEEM

Professor

- Digital signal, image and video processing
- Signal processing for communications
- VLSI implementations of signal processing algorithms and communication circuits

eraheem@uwindsor.ca
519-253-3000, Ext. 4795

DR. MAJID AHMADI

Distinguished University Professor
Associate Dean of Engineering Research and Graduate Studies

- Digital signal processing
- Machine vision
- Pattern recognition and neural network architectures
- VLSI implementation and computer arithmetic

ahmadi@uwindsor.ca
519-253-3000, Ext. 5076

Research Centre for Integrated Microsystems

- Excels in the advancement of Microelectromechanical Systems (MEMS) including: sensors and filters, capacitive microphones and 3D-acoustical sensing, electromagnetic microactuators, acousto-magnetic transducers, optical switching MEMS, automotive sensors, custom MEMS sockets and MEMS RADAR, micropower generators atomic force microscopy.
- Invests research efforts in innovative digital signal processing and communication technologies including: massively parallel arrays and special architectures, computer vision and image processing, network security management, pattern recognition and document analysis.
- Carries out research in microelectronics including: encryption, testing of mixed signal integrated circuits, field programmable chips and systems, high-speed DSP systems, CMOS and nanoelectric circuits design.

DR. SHAHPOUR ALIREZAEE

Assistant Professor

- Control systems and automation, PLC, SCADA and DCS System
- Telecommunication systems
- Discrete-time signal processing
- Image processing and machine vision

alirezae@uwindsor.ca
519-253-3000, Ext. 7472

Mechatronics Lab

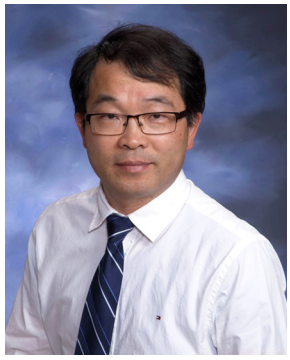
- Process Control and Automation Lab
- Manufacturing Production Systems(MPS) Lab
- PLC Lab

DR. BALAKUMAR BALASINGAM
Assistant Professor

- Autonomous (cyber, physical, human) systems
- Signal processing
- Machine learning
- Information fusion

singam@uwindsor.ca
519-253-3000, Ext. 5431

Autonomous Systems Laboratory
- Battery management system development
- Human-machine system automation
- Multi-target localization, tracking and control



DR. CHUNHONG CHEN
Professor

- Synthesis and optimization of digital integrated circuits
- VLSI computer-aided design
- High-performance low-power systems
- Nanoelectronic circuit design

cchen@uwindsor.ca
519-253-3000, Ext. 2574

DR. XIANG CHEN
Professor

- Robust control
- Control of networked systems
- Field sensor network
- Data-driven optimization
- Automotive control

xchen@uwindsor.ca
519-253-3000, Ext. 2570

DR. SAZZADUR CHOWDHURY
Professor

- Microscale sensing and actuation
- Solid state radars
- Ultrasonic transducers
- 3-D packaging and integration

sazzadur@uwindsor.ca
519-253-3000, Ext. 4794

Microelectromechanical Systems (MEMS) Lab
- Dedicated to developing microsystems that improve health care, automotive safety and security. The MEMS Lab is equipped with state-of-the-art microfabrication equipment and software.

DR. AREZOO EMADI

Assistant Professor

- Micro Electro Mechanical Systems (MEMS)
- Bio-medical devices
- Advanced sensors systems
- MEMS ultrasonic imaging
- Micro and nano fabrication technologies

arezoo.emadi@uwindsor.ca
519-253-3000, Ext. 5496

Smart Sensor System Lab

- Leading multidisciplinary research on developing advanced smart sensor systems: E-nose technology
- Focuses on revolutionary cost-effective diagnostic sensor technology for cancer detection at an early stage
- Aims to accelerate the development of micromachined sensors and transducers for medical, environmental science and agriculture applications using state-of-the-art micro and nano fabrication technology
- Research and development activities to integrate robust and sensitive sensors in portable electronic

DR. SHERVIN ERFANI

Professor

- Computer and network security
- Data networking
- Communication network management
- Multidimensional digital filter realization

erfani@uwindsor.ca
519-253-3000, Ext. 4794

DR. NARAYAN KAR

Professor of Electrical Engineering
Canada Research Chair in Electrified Transportation Systems

- Optimized design of electric machines for electric vehicle application
- Electric machine control and testing
- Electric vehicle modelling, simulation and testing

nkar@uwindsor.ca
519-253-3000, Ext. 4796
chargelabs.ca

Centre for Hybrid Automotive Research & Green Energy (CHARGE)

- 150 kW and six-phase electric vehicle powertrain tester with temperature measurement and water cooling capability for the test motor
- 25 kW proof-of-concept motor endurance testers with noise and vibration testing chamber
- Custom-designed 80 kVA and 30 kVA back-back, IGBT-based converters
- Opal RT-based, rapid control prototyping motor test system and electromagnetic simulation software packages
- Electric and hybrid electric vehicles and vehicle simulation software such as Autonomie and Matlab
- Multiple oscilloscopes, power quality and energy analysers, contact and surface temperature measurement devices, DC supplies, position and speed sensors, three-phase and six-phase load banks, etc.

DR. MOHAMMED KHALID

Associate Professor

- Field programmable chips and systems, FPGA-based system design, rapid prototyping
- FPGA-based high performance computing, heterogeneous computing systems
- Electronic design automation, high level synthesis
- Embedded system design for automotive electronic systems and Internet-of-Things (IoT)

mkhalid@uwindsor.ca
519-253-3000, Ext. 2611

Research Centre for Integrated Microsystems (RCIM)

- Powerful computer workstations running state-of-the-art CAD tools
- CAD tools: VHDL/Verilog based simulation and synthesis, High Level Synthesis
- High capacity and high performance FPGA boards

DR. HON K. KWAN

Professor

- Advanced digital filter design using evolutionary optimization
- Intelligent signal processing for neuroimaging analysis

kwan1@uwindsor.ca
519-253-3000, Ext. 2569

DR. MITRA MIRHASSANI

Associate Professor

- Hardware realization of neural networks
- Hardware security
- Analog and mixed-signal integrated circuits

mitramir@uwindsor.ca
519-253-3000, Ext. 2585

Analog and Mixed-Signal Research Lab

- The AMS lab explores and proposes solutions to overcome challenges for low-power and sub-nanometer design of analog integrated circuits
- The lab implements signal processing algorithms using integrated circuits for a specific application. Hence Application Specific Integrated Circuits (ASIC) method is used to tackle the issues and find efficient solutions
- The AMS lab collaborates with UWinSecurity, the Research Centre for Integrated Microsystems (RCIM) and the Cross Border Institute (CBI) for multi-disciplinary research
- The lab possesses state-of-the-art workstations and measurement instruments for various test and measurements required for verification and validation of theories

DR. ROBERTO MUSCEDERE

Associate Professor

- Very Large Scale Integration (VLSI) & Application Specific Integrated Circuit (ASIC) design
- System level design
- Embedded systems

rmusced@uwindsor.ca
519-253-3000, Ext. 4798

DR. RASHID RASHIDZADEH

Adjunct Professor
Academic Planning Liaison, Faculty of Engineering

- Test methodologies for integrated circuits
- Radio Frequency Identification (RFID)
- Smart sensors and IoT

rashidza@uwindsor.ca
519-253-3000, Ext. 3931

Research Centre for Integrated Microsystems (RCIM)

- A research team with extensive auto industry experience
- Successful auto industry products in the market
- State-of-the-art tools to design and implement electrical and electronic circuits

DR. MEHRDAD SAIF

Dean of Engineering
Professor

- Systems and control theory
- Model based fault detection and diagnostics
- Linear and nonlinear controller/observer design
- Large scale systems, optimal and intelligent control

msaif@uwindsor.ca
519-253-3000, Ext. 2566

DR. BEHNAM SHAHRRAVA

Acting Head, Electrical and Computer Engineering Department
Associate Professor

- Statistical communication theory
- Multiuser detection and channel estimation
- Iterative decoding algorithms
- Adaptive signal processing

shahrrav@uwindsor.ca
519-253-3000, Ext. 2572

DR. KEMAL TEPE

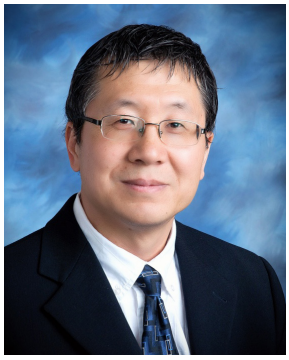
Professor

- Wireless communication networks
- Network security
- Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) communications
- Wireless sensor networks, Internet of Things (IoT) and Machine to Machine (M2M)

ktepe@uwindsor.ca
519-253-3000, Ext. 3426

Wireless Communications and Information Processing Lab (WiCIP)

- WiCIP focuses on designing reliable, energy efficient, and real-time, medium access control (MAC) and routing protocols for vehicular networks for safety and emergency applications and wireless sensor networks
- These protocols enable wireless communications to penetrate in such new applications as: smart grids; active safety and collision-avoidance systems in vehicles; control and monitoring in manufacturing and automation; data acquisition and collection from industrial processes; Internet of Things (IoT); machine-to-machine (M2M) communications; and e-health
- WiCIP's research activities are funded by Natural Sciences and Engineering Research Council of Canada, Canadian Foundation of Innovation, Federal Development Fund, and the Communication Research Centre of Canada



DR. HUAPENG WU

Professor

- Efficient hardware/software implementation of public key cryptography, (for example, Elliptic Curve Cryptosystem, RSA, Diffie-Hellman and NTRU)
- Cyber physical attacks and their countermeasures
- Wireless network security, IoT security
- Cloud computing security

hwu@uwindsor.ca
519-253-3000, Ext. 2568

DR. JONATHAN WU

Canada Research Chair in Automotive Sensor and Information Systems

Professor

- Computer vision systems for active vehicle safety and driver assistance
- Machine learning and sensor fusion for autonomous driving
- Sensor technology and big data analytics for medicine and cross-border security
- Distributed sensing for industrial monitoring and automation

jwu@uwindsor.ca
519-253-3000, Ext. 2580

Computer Vision and Sensing Systems Laboratory

- 3D imaging, multispectral imaging, microscopic imaging
- Embedded vision systems

ENGINEERING AT UWINDSOR

Mechanical, Automotive and Materials Engineering Department

DR. WALID ABDUL-KADER

Professor

- Sustainable manufacturing systems, virtual factory design
- Performance optimization
- Modelling of manufacturing/remanufacturing systems
- Lean manufacturing practices and implementation

kader@uwindsor.ca
519-253-3000, Ext. 2608

Systems Optimization Research Centre

- Lean Manufacturing, 5S, Total Productive Maintenance, Value Stream Mapping
- Process modeling and optimization, facilities layout assessment and improvement
- Performance evaluation/enhancement of production systems

DR. JALAL AHAMED

Assistant Professor

- Micro/nano-electromechanical (MEMS/NEMS) based sensors and actuators
- Micro/nano-fluidic based lab-on-a-chip for biological systems
- Micro/nano-fabrication and characterization
- Mechatronics, controls and electronics

jahamed@uwindsor.ca
519-253-3000, Ext. 2682

MicroNanoSystems Research Group

- Full cycle of development of MEMS/NEMS
- Theory, mask design, FEA modeling, fabrication, controls, electronics, packaging, imaging and testing
- Characterization expertise: SEM, TEM, AFM, XRD and Microscopy

DR. AHMET ALPAS

Professor
NSERC/GM Research Chair

- Microstructure-mechanical property relationships
- Deformation and fracture mechanism
- Pattern recognition and neural network architectures
- Wear of materials, wear resistant coatings including plasma sprayed coatings, PVD coatings, galvannealed steels & metal matrix composites

aalpas@uwindsor.ca
519-253-3000, Ext. 2602

Tribology of Materials Research Centre

- Conducts fundamental and applied research on friction, wear and lubrication of advanced engineering materials, composites and surface coatings.
- Focuses on understanding and improving the friction and wear behaviour of lightweight materials, like aluminum, magnesium and their composites and developing novel coatings to protect them against wear.

DR. BILL ALTENHOF

Professor

- Crashworthiness, impact testing, Finite Element Analysis (FEA)
- Experimental (destructive) testing, stress analysis
- Mechanical material testing and characterization under quasi-static and dynamic loading conditions
- Dynamics, machine design

altenh1@uwindsor.ca
519-253-3000, Ext. 2619

Crashworthiness, Impact and Materials Deformation (CIMD) Research Lab

- Large (45 kJ) and low (3 kJ) energy droptowers, pneumatic accelerator, split Hopkinson pressure bar apparatus allow for dynamic testing of materials and structures
- Digital image correlation system using high resolution low speed and high speed (Photron SA4) stereo cameras
- Computational deformation laboratory, allowing for large complex FE models to be studied having several millions of degrees of freedom

DR. AHMED AZAB ISMAIL

Associate Professor

- Production planning and scheduling
- Computer-assisted process and assembly planning
- Facility layout problem
- Decision Support Systems using advanced search methods and simulation

azab@uwindsor.ca
519-253-3000, Ext. 4958/5771
uwindsor.ca/pom

Production and Operations Management (POM) Research Lab

- Has partnerships primarily in the manufacturing sector, as well as healthcare, construction and agriculture
- Transformable/reconfigurable factory by Festo Inc.
- Stratasys FDM Additive Manufacturing machine
- PLM and digital manufacturing systems
- Optimization and discrete-event-simulation tools

DR. RANDY BOWERS

Associate Dean – Academic
Associate Professor

- Steel and welding in support of North American industry and infrastructure
- Engineering education

rbowers@uwindsor.ca
519-253-3000, Ext. 2601

DR. ALEKSANDR CHERNIAEV

Assistant Professor

- Composite materials: multiscale modeling, quasi-static and high strain-rate testing
- Impact mechanics of advanced materials: hypervelocity, high- and low-speed impact regimes
- Lightweight impact-resistant structures for space, aeronautical, automotive and other applications
- Applications of finite element (Lagrangian, Euler and ALE) and meshless (SPH, EFG) methods in structural impact and wave propagation problems
- Structural optimization for lightweight product engineering

aleksandr.cherniaev@uwindsor.ca
519-253-3000, Ext. 4136

Composite Materials and Lightweight Structures Research Centre

- Parameter identification for pre-existing and development of new constitutive material models for advanced materials to use in numerical simulations of static or dynamic processes
- Development of realistic micro-scale and meso-scale numerical models of materials with complex architecture
- Expertise in application of commercial finite element codes (LS-DYNA, AUTODYN, ANSYS) to problems involving complex composite layups, non-uniform through-the-thickness fiber distributions, static and impact loading, large deformations and erosion, composites crushing and material fragmentation
- Optimization of structures for minimal weight using commercially available tools and in-house optimization algorithms

DR. JEFF DEFOE

Assistant Professor

- Development and implementation of simplified models of fans and compressors for use in numerical simulations
- Assessment of the impact of non-uniform flows on the aerodynamic and acoustic performance of turbomachines
- Use of combined numerical and experimental approaches to gain insight into key physical mechanisms governing turbomachine and general fluid flow behavior

jdefoe@uwindsor.ca
519-253-3000, Ext. 5961

Turbomachinery and Unsteady Flows Research Group

- Expertise in computational fluid dynamics for internal flows (turbomachines, general flow devices)
- Expertise in computational aero-acoustics

DR. NICKOLAS EAVES

Assistant Professor

- Developing fundamental and reduced numerical models for nanoparticle aerosol processes
- Combustion, internal combustion engines, gas turbines, jet engines
- Soot/particulate and other pollutant formation
- Alternative fuels and biofuels
- Atmospheric black carbon restructuring

nickolas.eaves@uwindsor.ca
519-253-3000, Ext. 5924

Nanoparticle Aerosol Computational Engineering (Nano-ACE) Group

- Development of reduced-order models for soot/particulate and other emissions from combustion devices (internal combustion engines, gas turbines, jet engines) suitable for parametric design studies

DR. AFSANEH EDRISY

Associate Professor

- Microstructures and mechanical properties relationship
- Tribology and fatigue of light weight alloys/ composites for automotive and aerospace applications
- Mechanical characterization of thin films and coatings
- Surface engineering (laser cladding and additive manufacturing)

edrisy@uwindsor.ca
519-253-3000, Ext. 2622

DR. HODA ELMARAGHY

Distinguished University Professor
Director, Intelligent Manufacturing Systems Centre (IMSC)

- Enablers of changeable, reconfigurable and flexible manufacturing systems
- Co-evolution and co-development of products and manufacturing systems for economic and energy sustainability
- Product design, customization and variety managing
- Intelligent manufacturing systems, industry 4.0 enablers and learning factories

hae@uwindsor.ca
519-253 3000, Ext. 5034
uwindsor.ca/imsc

Intelligent Manufacturing Systems Centre (IMSC)

- The IMSC pursues leading-edge research in the multidisciplinary field of manufacturing systems and related topics from product design to manufacturing and the complete product life cycle
- The IMSC engages in projects with industry, networks and centres of research excellence, as well as international collaborations and exchanges. Its research is supported nationally and provincially
- The centre features the "iFactory" reconfigurable and changeable manufacturing system – a first in North America; the iDesign studio for innovation, collaboration, modelling, simulation and life cycle analysis; and digital metrology (DEA Mistral CMM) and physical prototyping (prodigy – dimensions) capabilities

DR. WAGUIH ELMARAGHY

Professor
Director, Intelligent Manufacturing Systems Centre (IMSC)

- Design and development of smart products and systems
- Complexity management in design and manufacturing
- Sustainable and changeable products
- Systems and supply chains

wem@uwindsor.ca
519-253-3000, Ext. 3431
uwindsor.ca/imsc

Intelligent Manufacturing Systems Centre (IMSC)

- The IMSC pursues leading-edge research in the multidisciplinary field of manufacturing systems and related topics from product design to manufacturing and the complete product life cycle
- The IMSC engages in projects with industry, networks and centres of research excellence, as well as international collaborations and exchanges. Its research is supported nationally and provincially
- The centre features the "iFactory" reconfigurable and changeable manufacturing system – a first in North America; the iDesign studio for innovation, collaboration, modelling, simulation and life cycle analysis; and digital metrology (DEA Mistral CMM) and physical prototyping (prodigy – dimensions) capabilities

DR. EUNSIK KIM

Assistant Professor

- Occupational ergonomics, ergonomic intervention, physiological measurement and analysis
- Biomechanics, musculoskeletal disorders, manual material handling
- User-centered product design
- Gamification, engineering education

eskim@uwindsor.ca
519-253-3000, Ext. 5409

DR. AMIR FARTAJ

Professor

- Vehicle thermal management
- Heating, ventilation, air conditioning and refrigeration (HVACR)
- Nano fluids, heat exchangers
- Phase change materials (PCM), battery thermal management

fartaj@uwindsor.ca
519-253-3000, Ext. 2618

Thermal Management Research Laboratory

- Integrated Thermal Wind Tunnel
- Thermophysical Property Analyzer

DR. PETER FRISE

Professor
Director, Centre for Automotive Research and Education

- Mechanical design and packaging studies
- Plastic molding technologies and machinery troubleshooting
- Fatigue of large welded structures
- Development, management and governance of R&D programs

pfrise@uwindsor.ca
519-253-3000, Ext. 3888

DR. DANIEL E. GREEN

Associate Professor
Canada Research Chair in the Development and Optimization of Metal Forming Processes

- Sheet metal forming, high strain rate deformation, hot stamping
- Mechanical testing, formability testing, material anisotropy
- Finite element modelling, process optimization
- Applications to automotive manufacturing

dgreen@uwindsor.ca
519-253-3000, Ext. 3887

Development and Optimization of Metal Forming Processes

- 240-ton, double-action, hydraulic press (36" x 24" bed size)
- Mechanical testing; formability testing; forming limit diagrams
- Microstructural characterization

DR. HENRY HU
Professor

- Mathematical modeling, solidification behavior
- Light metal casting processes, development of light alloys and composites
- Die casting process control

huh@uwindsor.ca
519-253-3000, Ext. 2623

Advanced Lightweight Materials Processing Lab
- Squeeze casting machine
- Casting simulation software (Magmasoft)
- Electric resistance furnaces for novel materials preparation

DR. OFELIA A. JIANU
Assistant Professor

- Sustainable Energy Systems – design and performance improvement
- Hydrogen production through water splitting technologies
- Noise pollution prevention in wind turbines
- Wind turbine placement for optimum performance

ofelia.jianu@uwindsor.ca
519-253-3000, Ext. 5943

DR. JENNIFER JOHRENDT
Assistant Dean of Student Affairs, WINONE
Associate Professor

- Vehicle structural durability testing and simulation
- Neural network characterization of material properties and processing parameters
- Composites design for vehicle lightweighting
- Driver modeling from simulation & real-time data collection

j.johrendt@uwindsor.ca
519-253-3000, Ext. 2625

Vehicle Dynamics and Control Research Group
- Neural network modeling of large data sets
- Full vehicle durability data analysis

DR. BRUCE MINAKER
Associate Professor

- Vehicle dynamics and control
- Multibody dynamics
- Numerical modeling and simulation
- Suspension design

bminaker@uwindsor.ca
519-253-3000, Ext. 2621

Vehicle Dynamics and Control Research Group
- Multibody dynamics and related software development

DR. XUEYUAN NIE
Professor

- Plasma surface engineering, thin films and coatings
- Micro/nanoscale mechanics and tribology, corrosion
- N/MEMS device materials
- Biomaterials, nanomaterials and nanofabrication

xnie@uwindsor.ca
519-253-3000, Ext. 4148

Plasma Surface Engineering and Nanotechnology Lab
- Hard coating deposition equipment (for wear and corrosion resistance)
- Impact-sliding surface fatigue wear tester (simulating extremely high stresses)
- High speed tribometer (up to 10 m/s sliding velocity)
- Electrochemical corrosion tester

DR. DEREK NORTHWOOD
Distinguished University Professor

- Microstructure-properties- performance-processing relationships
- Lightweight (Al,Mg) materials for automotive and other applications
- Materials for energy application, including fuel cells, batteries and hydrogen storage distortion
- Novel materials synthesis methods, surface-engineering for improved corrosion and wear

dnorthwo@uwindsor.ca
519-253-3000, Ext. 4785

DR. COLIN NOVAK
Associate Professor

- Design and test for applications in automotive noise and vibration control
- Environmental noise and vibration control
- Study of binaural hearing perception and development of psychoacoustic metrics
- Structural modal test and control design for mechanical vibration properties

novak1@uwindsor.ca
519-253-3000, Ext. 2634

Noise, Vibration and Harshness Sound Quality (NVH-SQ) Research Group

- Hemi-anechoic test facilities
- 120 channel acquisition, beamforming microphone arrays, structural modal test facilities, durability shaker facility
- Jury test facilities Including NVH driving simulator and binaural heads for product sound acquisition

DR. LEO ORIET
Professor

- Former Auto Industry Senior Management Executive
- Private Sector – Manufacturing Engineering
- Private Sector – Product Engineering
- Inventor

loriet@uwindsor.ca
519-253-3000, Ext. 2699

DR. ZBIGNIEW PASEK
Professor

- Financial and risk analysis in engineering
- Industrial automation and controls
- Engineering entrepreneurship and creativity

zjpasek@uwindsor.ca
519-253-3000, Ext. 4738

DR. DANIELA PUSCA
Associate Professor

- Engineering design, computer aided design
- Design for manufacturability and assembly
- Engineering education

dpusca@uwindsor.ca
519-253-3000, Ext. 2606

DR. AFSHIN RAHIMI

Assistant Professor

- Model-based and data-driven fault detection, diagnostics and prognosis
- Systems and control theorys
- Linear & nonlinear controller/observer design
- Artificial intelligence, machine learning and intelligent systems
- Avionics, sensors, and measurement

arahimi@uwindsor.ca
519-253-3000, Ext. 5936

DR. GARY RANKIN

Professor

- Numerical and experimental modelling of industrial and agricultural thermo-fluid-dynamic processes and equipment
- Modern flow measurement of local velocities, pressures and temperatures as well as traditional dye injection and Schlieren flow visualization techniques for flows ranging from low speed laminar to supersonic
- Collaborative projects with ten industrial partners over a thirty-year period with partial financial support from organizations like the Natural Sciences and Engineering Research Council and Ontario Centres of Excellence
- Current research interests include non-moving part fluid (fluidic) switches, travelling shock waves and vortex flow cooling devices

rankin@uwindsor.ca
519-253-3000, Ext. 2626

Fluid Dynamics Research Institute (FDRI)

- FDRI is composed of a group of faculty and student members with a common interest in thermo-fluid mechanics
- The purpose of FDRI is to foster collaborations among its members for the purposes of the advancement of research and education to better serve industry and the university community

DR. GRAHAM READER

Professor

- Energy conversion
- Clean diesel engine technologies
- Underwater vehicles
- Stirling cycle machines

greader@uwindsor.ca
519-253-3000, Ext. 5105

DR. REZA RIAHI

Associate Professor

- Corrosion and coatings
- Tribology and metal forming
- Composites
- Machining

ariahi@uwindsor.ca
519-253-3000, Ext. 3567

Surface and Tribology Lab

- Tribological characterization of metals and polymers (low and high temperature) and evaluation of corrosion of materials (electrochemical and atmospheric)
- Surface characterization
- Metal forming simulation, investigation of cutting and forming tool interactions with the workpiece

DR. BETH-ANNE SCHUELKE-LEECH

Assistant Professor

- Engineering entrepreneurship
- Big data and text data analytics
- Technological innovation
- Engineering and industrial policy

beth-anne.schuelke-leech@uwindsor.ca
519-253-3000, Ext. 5937

STEP Disruptive Technologies Research Lab

- Examines the Socio-Technical-Economic-Political (STEP) implications of disruptive technologies
- Conducts research into the design, analysis, and implications of developing technologies on manufacturing, energy, and engineering systems
- Investigates the technological changes and disruptions that are needed to achieve the vision of Smart Cities, Sustainability, and Resilient Systems. This includes looking at the needed developments in connectivity, artificial intelligence, automation, autonomous systems, and the implications of these developments

---

DR. ANDRZEJ SOBIESIAK

Head, Mechanical, Automotive and Materials Engineering Department
Professor

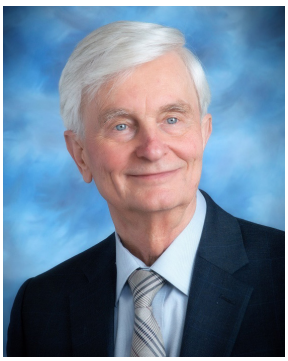
- Internal combustion engines
- Combustion
- Alternate fuels
- Measurements in flows and flame

asobies@uwindsor.ca
519-253-3000, Ext. 3886

Combustion Research Lab

- Focuses on combustion process modifications and re-organization to reduce or even eliminate the need for after-treatment technologies for internal combustion engines and industrial burners that use both premixed and non-premixed flames
- State-of-the-art facilities include HCCI engine and Split-cycle engine test benches with dynamometers, in-cylinder pressure measurements for engines indicated performance and combustion phasing analysis, and emissions benches for exhaust gas characterization, instrumented flame propagation apparatus with fast imaging capability, and a unique multiple-coflows inverse flame burner

---



DR. JERRY SOKOLOWSKI

Professor

- Development and industrial commercialization of new casting materials and technologies (metallurgy, casting, heat treatment and machining)
- Development of new analytical and testing techniques as well as technology platforms applied to aluminum, magnesium and cast-iron components

jerry@uwindsor.ca
519-253-3000, Ext. 3588

Metal Casting and Post-Processing Technology Group

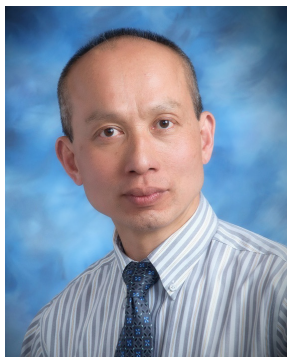
- Develops high durability alloys and their processing technology for next generation engine components
- Improves metallurgical integrity and process productivity of engine blocks
- Develops novel technology platforms, analytical, testing, melt and cast components treatment, physical simulations and commercialization
- Features state-of-the-art Universal Metallurgical Simulation and Analysis (UMSA) instrument, which combines a sophisticated melting, solidification, cooling and heat treatment processing and thermal analysis of ferrous and non-ferrous alloys and MMC

DR. VESSELIN STOILOV

Professor

- Micro/nanoscale mechanics and tribology
- Modeling and characterization of active materials (shape memory alloys, piezoelectric, ferroelectric, and magnetostrictive materials)
- Multi-scale modeling
- Design and characterization of N/MEMS

vstoilov@uwindsor.ca
519-253-3000, Ext. 4149



DR. DAVID TING
Professor

- Flow turbulence, combustion
- Flow-Induced vibration
- Energy systems, heat transfer
- Aerodynamics

dting@uwindsor.ca
519-253-3000, Ext. 2599
turbulenceandenergylab.org

Turbulence and Energy Lab

- Low speed wind tunnel
- Six channel hot wire anemometry
- Computational fluid dynamics

DR. JILL URBANIC
Associate Professor

- Additive manufacturing, 3D printing, rapid prototyping
- CAD/CAM, process planning and manufacturing systems design
- Product design for manufacturing, product and process design optimization
- Reverse engineering

jurbanic@uwindsor.ca
519-253-3000, Ext. 2633

DR. MICHAEL WANG
Professor

- Product innovation
- Sustainable product design and manufacturing

wang5@uwindsor.ca
519-253-3000, Ext. 2610

DR. NADER ZAMANI-KASHANI
Professor

- Finite element analysis
- Computational mechanics
- Computer aided engineering

zamani@uwindsor.ca
519-253-3000, Ext. 2643

DR. GUOQING ZHANG

Professor

- Optimization, operational research, operations algorithms
- Supply chain management, logistics, transportation
- Modelling of manufacturing, production scheduling, operations management
- Intelligent decision support systems and data analysis

gzhang@uwindsor.ca
519-253-3000, Ext. 2637
uwindsor.ca/scm

Supply Chain Management and Logistics Optimization Research Centre

- Facilitates the applications and innovation of RFID, IoT, big data, and artificial intelligence in supply chain management, logistics, and process improvement
- Provides analysis and improvement of all stages/aspects of supply chain management, including forecasting, inventory, purchasing, production planning, warehousing, transportation, ERP, information system, pricing, risk and resilience, and service performance

---

DR. MING ZHENG

Professor
NSERC/Ford Senior Industrial Research Chair in Clean Combustion Engine Innovations

- High efficiency engines, clean combustion engines
- Emission control and diagnostics; active exhaust after treatment
- Alternative fuel and biofuel combustion
- High-energy spark ignition, corona ignition

mzheng@uwindsor.ca
519-253-3000, Ext. 2636

Clean Combustion Engine Lab

- Test engines: single-cylinder research engines and multi-cylinder engines running in single-cylinder mode with Engine dynamometers: double-ended direct current, alternating current, and eddy current dynos with Fuels: diesel, gasoline, alcohol, n-butanol, DME, biodiesel, and blends
- Independent and adaptive control systems for air management (such as boost, temperature, back pressure) and fuel management (such as multiple-injections, dual-fuel applications) using RT-FPGA based control hardware
- Injection test bench and long-tube setup for fuel rate of injection measurement and high-speed high-intensity LED lighting system, in-cylinder combustion imaging

---

DR. BIAO ZHOU

Professor

- Computational Fluid Dynamics (CFD), Heat Transfer, and Combustion
- Fuel Cell, Catalyst and Related Nano-Materials, Fuel Cell Hybrid Powertrain
- 3D Printing (Additive Manufacturing Technologies)
- Unmanned Aerial Vehicles (UAVs)
- Clean Combustion (Internal Combustion Engine, Jet Engine, Coal)

bzhou@uwindsor.ca
519-253-3000, Ext. 2630

Clean Powertrain Lab

- Computational Fluid Dynamics Code Development Platforms: KIVA, ANSYS FLUENT, OPENFOAM, in-house codes for two-phase flow and combustion.
- Advanced Fuel Cell Test Stand: automatic data acquisition system for temperature, pressure, pressure drop, humidity, flowrate, etc.
- Nano-Materials Lab: electro-spinning setup, furnaces, coating equipment, mixer, etc.
- Fuel Cell - Battery Hybrid Vehicle Test Bench: automatic data acquisition system for current, voltage, power, speed, motor and battery monitoring, etc.
- Battery Management System Test Bench: automatic data acquisition system for current, voltage, power, charging/discharging battery, etc.
- Access to Industry and Government Labs: automotive industry (diesel engine research), fuel cell industry (PEM fuel cell research), and National Research Council Canada (fuel cell, gas turbine