

Summary of Faculty Research Interests and Profiles

Researcher Name	Contact Information	Research Interest
N. Barakat (Chair)	nbarakat@uttyler.edu	Mechatronics, Energy Harvesting, Robotics and Automation, Control Systems and System Integration, Engineering Leadership, Ethics, and Professionalism
M. Biswas	mbiswas@uttyler.edu	Process & system dynamics and control, fuel cell systems, Machine Learning-based Modeling
F. Brown (Graduate Coordinator)	fbrown@uttyler.edu	Multiscale Modeling and Simulation; Computational Fluid Dynamics and Heat Transfer; Energy Transport, Conversion and Storage; Sustainable Energy; Thermal Management; Transport Phenomena in Biological Systems; Engineering Education
S. Chou	schou@uttyler.edu	Functional Biomaterials, Materials Characterizations, Drug Release, Tissue Engineering, Wound Healing, Anticoagulation.
N. Fumo	nfumo@uttyler.edu	Energy Efficiency and Energy Conservation in Buildings, Building Energy Modeling, Residential HVAC Systems, and Engineering Education.
A. Garcia	a.garcia@uttyler.edu	Material science and applications multi-physics modeling as well as CAD/CAM systems and DoE applications.
C. Goh	cgoh@uttyler.edu	Medical Device Design, Kinematics and Control Systems, Computer-Aided Integrated Design and Manufacturing, Artificial Intelligence-based Modeling and Simulation, Advanced Finite Element Analysis, Crystal Plasticity
Tyler Hall	thall@uttyler.edu	Computational Fluid Dynamics & Computational Heat Transfer of high speed reacting flows. Numerical grid generation for unstructured and adaptive grids.
W. Ibrahim	aibrahim@uttyler.edu	Mechatronics, Energy Harvesting for Biomedical Applications, Vibration Energy Harvesting, Linear and Nonlinear Dynamics, Designing and Modeling MEMS Sensors and Actuators.
T. Khajah	tkhajah@uttyler.edu	Numerical analysis of wave propagation, shape optimization, Finite Element Method, Isogeometric Analysis, Scaled Boundary Finite Elements, Image-based analysis, Evolutionary optimization, Absorbing Boundary Conditions.
H. Rizvi	hrizvi@uttyler.edu	Polymer composites, Biomaterials, Materials Characterization, Bioinspired architectures, Bio-products.

<p>M. Sathyamoorthy (Accreditation Coordinator)</p>	<p>msathyamoorthy@utt Tyler.edu</p>	<p>General Areas of Solid Mechanics; Nonlinear Analysis of Beams, Plates and Shells; Composite and Stiffened Structures; Aircraft Structures; Mechanisms; Thermal Stresses; Finite Element Methods; Experimental Investigations; Vulnerability Analysis. However, I have not been actively involved in any of these research areas over the last 26 years.</p>
---	---	--

Faculty profiles

Nael Barakat:

Dr. Barakat's research interest includes the area of Mechatronics, Robotics, Dynamic Systems and Control, as well as Engineering Leadership, Ethics, Professionalism, and Engineering Education. Currently he is working on energy harvesting devices to improve their performance, such as utilizing electromagnetic based devices nonlinear phenomena. Dr. Barakat is also working on parallel on Engineering education and leadership topics as well as sustainability and societal impact of technology.

Mohammad Biswas:

Dr. Biswas has research interests in process & system dynamics and control including thermal fluid modeling of fuel cell systems. His current research project in collaboration with NASA JSC involves thermal fluid model development of a reformer integrated fuel cell system to analyze and optimize the power and thermal management for a wide range of operating conditions. He also has interests in black box modeling using machine learning techniques in fuel cell system and residential building energy applications."

Fredericka Brown:

Dr. Brown's research interests include modeling and simulation of thermal/fluid transport phenomena in physiological and engineered systems, energy transport, conversion and storage, and engineering education. Employing a combination of theoretical and computational approaches, she investigates a broad range of thermal fluids and energy systems covering a range of scales from micro- and nano-scales to macro-scales. Some of her previous research projects include modeling and simulation of the efficiency of parabolic solar trough collectors used for domestic heating applications, thermal comfort and energy demands, and thermal transport phenomena in skin and kidney. She is also actively involved in engineering education research where the application of research methods from education, learning sciences, and behavioral sciences are used to address issues critical to the success of students in engineering, in particular her area of focus is on teaching and learning.

Shih-Feng Chou:

Dr. Chou's research interests include synthesis and characterization of functional biomaterials for drug release and tissue engineering applications. Currently he is working on the development of drug-eluting

fibers that can be used for dressing materials to promote healing of chronic and/or non-healing wounds. He is also interested in fabrication of “designer surfaces” using polymeric membranes to provide anticoagulation properties for implantable biomedical devices.

Nelson Fumo:

Dr. Fumo’s research interests include general area of energy efficiency and energy conservation in buildings including building energy modeling, thermal energy systems design and optimization, and HVAC applications; renewable energy applications with emphasis on solar energy and ground source heat pumps; engineering education with focus of laboratory courses.

Andres Garcia:

Dr. Garcia’s research focuses on design and development of advance materials, and systematic process control. Also, his research encompasses the integrating of advanced technology with following: 1) Application of Multiphysics finite-element modeling principles, 2) Lightweight technology research (focuses on Polymer composites and multi-alloy-based material systems), 3) Research and development on CAD/CAM integrated systems and related technology, and 4) Application of Design of experiment (DoE) and Analysis of Variance (ANOVA) principles to obtain optimal processing condition.

Chung Hyun Goh:

Dr. Goh’s research interests include the areas of design, manufacturing, and material science and engineering. He is currently working on Medical Device design such as Robotic Walking Training Device and Robotic Patient Transfer Device. Dr. Goh is also interested in establishing Artificial Intelligence-based Framework of Modeling and Simulations in the connection with motion capture, kinematics and control systems

Wathiq Ibrahim:

Dr. Ibrahim’s research interests include Mechatronics, Energy Harvesting for Biomedical Applications, Vibration Energy Harvesting, Linear and Nonlinear Dynamics, Designing and Modeling MEMS Sensors and Actuators. Currently, he is working on energy harvesting for health monitoring systems and biosensors, mainly on implantable self-powered load sensor for knee implants. Dr. Ibrahim is also working on vibration energy harvesting through piezoelectric and triboelectric mechanisms with advanced mathematical modeling and simulation tools to predict complex nonlinear dynamic phenomena such as softening, hardening, combination behavior, and chaos.

Tahsin Khajah:

Dr. Khajah’s research interests include numerical analysis of wave propagation and related shape and topology optimization. Currently he is working on problems arising in the numerical solution of Helmholtz’s and Maxwell’s equation, in high fidelity unbounded domains. He is also interested in implementing a combination of optimization and precise analysis to improve the state of the art engineering applications relying on wave phenomena such as ultrasound, non-destructive testing, object recognition etc.

Hussain Rizvi:

Dr. Rizvi's research interests include the area of sustainable bio-products and bioinspired design for multifunctional applications. His recent projects include synthesis of corrosion resistant polymer coating reinforced with nano-plates stacked to decrease the permeation rate and improve durability. Development of carbon fibers from renewable and environmentally friendly sources. He is currently working on a hierarchical fiber design for smart textiles applications.

M. Sathyamoorthy:

Dr. Sathyamoorthy's research covers a broad range of interests in solid mechanics including nonlinear analysis of structures and structural elements such as beams, plates, shells, composite and stiffened structures, aircraft structures, finite element methods and vulnerability analysis of military aircrafts. However, he has not been actively involved in any of these research areas over the last 26 years. He was deeply involved in academic administration at various levels from Associate Chair to Associate Provost. His current interests are in engineering education, literacy with particular attention to child literacy and STEM education.