Tufts Principal Investigators (PI's)

Chemistry

Yu-Shan Lin
Research/Areas of Interest: Theoretical and computational biophysical chemistry

Clay Bennett
Research/Areas of Interest: Organic synthesis, carbohydrate chemistry, synthetic methodology, and bioorganic chemistry

Ira Caspari-Gnann
Research/Areas of Interest: Chemistry and STEM education

Krishna Kumar
Research/Areas of Interest: Bioorganic chemistry and chemical biology

Charlie Mace
Research/Areas of Interest: Bioanalytical and materials chemistry

Electrical and Computer Engineering

Thomas Vandervelde
Research/Areas of Interest: Interaction of light with matter, physics of nanostructures and interfaces, metamaterials, material science, plasmonics and surfactants, semiconductor photonics and electronics, epitaxial crystal growth, and materials and devices for energy and infrared applications

Shuchin Aeron
Research/Areas of Interest: Data science, statistical signal processing, inverse problems, compressed sensing, information theory, convex optimization, machine learning, algorithms for geophysical signal processing, compressed sensing architectures and evaluation, and video and image data acquisition and processing

Marco Donato
Research/Areas of Interest: Emerging technologies, non-volatile memories, SoC design, hardware for machine learning, and noise modeling and reliability

Mark Hempstead
Research/Areas of Interest: Computer architecture, computer systems, power-aware computing, embedded systems, mobile computing, computer systems for machine learning, workload characterization, quantum computing, and learning sciences and computer systems for human subjects research

Peter Lu
Research/Areas of Interest: Scientific machine learning: physics-informed ML, representation learning, generative modeling, interpretability AND complex systems: nonlinear dynamics, chaos, interacting quantum systems, materials science, and fluid turbulence

Valencia Koomson
Research/Areas of Interest: Biomedical instrumentation, AI-powered wearable devices, biophotonics, optoelectronic integrated systems, health informatics, human-centered design, and health equity research

Yingjie Lao
Research/Areas of Interest: Trusted AI, hardware security, electronic design automation, VLSI architectures for machine learning and emerging cryptographic systems, and AI for healthcare and biomedical applications

Eric Miller
Research/Areas of Interest: Statistical- and physics-based signal and image modeling and processing, tomographic image formation and object characterization, and inverse problems (applications explored include human performance assessment, materials science, airport security, medical imaging, environmental monitoring and remediation, unexploded ordnance remediation, and automatic target detection and classification)

Aseema Mohanty
Research/Areas of Interest: Nanophotonics, optical beam shaping, neuroengineering, chip-scale imaging and microscopy, and quantum information systems

Karen Panetta
Research/Areas of Interest: Developing efficient algorithms for simulation, modeling, and signal and image processing for security and biomedical applications

Paul Simmonds
Research/Areas of Interest: Experimental development of novel semiconductor nanostructures for quantum information sciences and tailoring crystal symmetry and strain at the nanoscale to produce next generation optoelectronic devices

- MBE growth, chamber maintenance, and system support.
- Low-temperature, high-field magnetoresistance quantized carrier/spin transport (quantum Hall effects, Shubnikov-de Haas oscillations, 1D quantized conductance, 0.7 structure, etc.).

- Atomic force microscopy (AFM), transmission electron microscopy (TEM), X-ray diffraction (XRD) and photoluminescence (PL), Raman spectroscopy, ellipsometry, Rutherford back scattering, etc.
- Cleanroom-based micro/nanofabrication including photo- and e-beam-lithography, metallization, and device packaging

Sameer Sonkusale
Research/Areas of Interest: Bioelectronics, Biomedical microdevices, Wearables, Ingestibles, Biomedical circuits and systems, micro and nano fabrication, lab-onchip microsystems, global health and precision medicine, CMOS image sensors for scientific imaging, analog to information converters, analog computing, brain inspired machine learning, active metamaterial devices, circuits, and systems, and terahertz

Mai Vu
Research/Areas of Interest: Machine learning, applied optimization, wireless communications and networks, and 5G/6G systems and techniques

Mathematics

Todd Quinto
Research/Areas of Interest: Tomography (mapping the interior structures of objects using indirect data such as X-rays) and integral geometry

Kasso Okoudjou
Research/Areas of Interest: Time-frequency analysis, pure, applied, and numerical harmonic analysis (wavelet analysis, frame theory, time-frequency analysis of pseudo-differential equations and its application to non-linear PDEs), analysis and differential equations on fractals and graphs (spectral analysis and their applications to data sciences), and mathematics education

Fulton Gonzalez
Research/Areas of Interest: Noncommutative harmonic analysis, representations of Lie groups, integral geometry, and Radon transforms