Northeastern University College of Engineering

2018 | 2019

Fang Lab

SCHOLARSHIP REPORT ELECTRICAL AND COMPUTER ENGINEERING

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We are a leader in experiential education and interdisciplinary research, focused on Engineering for Society



Dear Colleagues and Students,

The Department of Electrical and Computer Engineering (ECE) at Northeastern University is happy to provide you with our annual Scholarship Report, describing the research and accomplishments of our esteemed faculty over the past year. This report serves as a reminder of the transformative and impactful research being done in ECE at Northeastern.

Two new tenure-track faculty joined our department, including Associate Professor Josep Jornet in the area of Networking and IoT and Assistant Professor Milad Siami in the area of Controls and Robotics. The year also saw the appointment of four new Research Professors namely: Dana Brooks, Emrecan Demirors, Sumientra Rampersad, and Zhenyun Qian. Additionally, we welcome two new Teaching Professors: Elena Bernal-Mor and Iman Salama.

In the last year, we formed three new research institutes and centers, including the Institute for the Wireless Internet of Things led by Professor Tommaso Melodia, the Institute for Experiential Robotics led by Associate Professor Taskin Padir, and the Northeastern SMART Center led by Associate Professor Matteo Rinaldi. In addition, the year saw several new projects being funded, such as continued funding at more than \$4M for the Awareness and Localization of Explosives-Related Threats (ALERT) Center from the Department of Homeland Security led by COE Distinguished Professors Michael Silevitch and Carey Rappaport; a \$4.3M grant by the National Science Foundation, entitled PAWR Platform POWDER-RENEW: A Platform for Open Wireless Datadriven Experimental Research with Massive MIMO Capabilities awarded to Professor Tommaso Melodia; and a \$3.5M grant awarded to a team of faculty led by Associate Professor Kaushik Chowdhury for Advancing Warfighter Technologies by the US Navy, to name just a few.

Several of our faculty have also received prestigious recognitions. Professor Tommaso Melodia was named the William Lincoln Smith Chair Professor in ECE; Prof. Dagmar Sternad was named a University Distinguished Professor; Professor Bahram Shafai received the Lifetime Achievement Award from the World Automation Congress (WAC); Professors Mario Sznaier and Raymond Fu were named as Fellows of the IEEE; Professor Fu was also named Fellow of the Optical Society (OSA); and Assistant Professors Hui Fang and Pau Closas received CAREER Awards from the National Science Foundation. In addition, ECE faculty were granted 11 U.S. Patents in the last year.

These are just a few of the many research efforts and accomplishments in ECE. Several other highlights are featured in the Faculty Honors and Awards section of this Scholarship Report, and we hope you can come see all the exciting work being done in our wonderful department and college for yourself.



Sincerely,

Srinivas Tadigadapa Chair of Electrical and Computer Engineering s.tadigadapa@northeastern.edu



Electrical and Computer Engineering

The department offers **8** research concentrations and is either the lead or partner of **9** federally-funded research centers and institutes.

New Research Institutes and Centers:

Institute for Experiential Robotics Institute for the Wireless Internet of Things

Northeastern SMART Center

TENURED/

Faculty

TENURE-TRACK

\$30M Annual Faculty Research Expenditures

DHHS NSF DOD Federal/Other DOE Foreign

RECENT HIRES

Josep Jornet PhD, Georgia Institute of

Technology

Milad Siami

PhD, Lehigh University

Foundation/Non-Profit Industry/Corporation



Masters Students

24% female female Doctoral Students



Professional Society Fellows Including 12 IEEE Fellows



Young Investigator Awards, including **16** National Science Foundation CAREER Awards



College of Engineering

With **185** tenured/tenuretrack faculty and **16** multidisciplinary research centers and institutes with funding by eight federal agencies, the College of Engineering is a leader in experiential education and interdisciplinary research, with a focus on discovering solutions to global challenges to benefit society.







YOUNG INVESTIGATOR Awards





Graduate Students Placed on Co-op (2018-19)

STUDENTS ENROLLED



52% Graduate 1485 New MS (Fall 2018) **48% Undergraduate** 675 New BS (Fall 2018)

FACULTY HONORS AND AWARDS

Professor **Yun Raymond Fu** has been elevated to an IEEE Fellow, named a Fellow of The Optical Society, and selected as a distinguished



member of the Association for Computing Machinery.



Dennis Picard Trustee Professor **Mario Sznaier** is a co-principal investigator for a \$7.5M Department of Defense grant, in collaboration

with the University of Texas at Austin and Princeton University, for a Multidisciplinary University Research Initiative (MURI) project aimed at developing artificial intelligence for UAVs. Sznaier was also elevated to an IEEE Fellow for his contributions to identification of switched systems and multiobjective control.

Assistant Professor **Hui Fang** has been awarded a \$500K National Science Foundation CAREER Award for the project, "Transforming Neural Interfaces Using Stretchable, Transparent, Multifunctional Nanomesh Microelectrodes."



William Lincoln Smith Chair Professor **Tommaso Melodia** is the founding director of Northeastern's new Institute for the Wireless Internet of Things, which will help build the next generation of wireless technologies. The institute serves as the academic lead for the Platforms for Advanced Wireless Research Project Office, a \$100 million public-private partnership to build city-scale testbeds for advanced wireless technologies, digital ecosystems, and how they can power IoT in new ways. Melodia was also selected as an IEEE Distinguished Lecturer.

Professor Bahram Shafai received the Lifetime Achievement Award from the World Automation Congress (WAC) 2018 for



outstanding contributions to robust stability and control of multivariable systems and observer design for fault detection.



Assistant Professor **Pau Closas** received a CAREER Award from the National Science Foundation for "Secure and

Ubiquitous Position, Navigation and Timing."

Matteo Rinaldi, associate professor and director of the Northeastern SMART research center.



was awarded a \$1.7M grant from the U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) for "Zero-Power Wireless Infrared Digitizing Sensors for Large Scale Energy-Smart Farm."





Assistant Professor **Sarah Ostadabbas** is the Northeastern University principal investigator of a

collaborative \$1.2M National Science Foundation grant with the University of Pittsburgh on "SCH: INT: Collaborative Research: Detection, Assessment and Rehabilitation of Stroke-Induced Visual Neglect Using Augmented Reality (AR) and Electroencephalography (EEG)."



Professor **Yunsi Fei** and Assistant Professor **Xue (Shelley) Lin**, along with Associate Professor Thomas Wahl in the Khoury College of Computer Sciences, were awarded a \$1.2M National Science Foundation grant for "Protecting Confidentiality and Integrity of Deep Neural Networks against Side-Channel and Fault Attacks."

Assistant Professor **Xue (Shelley)** Lin will lead a \$1.2M National Science Foundation grant, in collaboration with Professor **Miriam Leeser** and the University of Southern California, on developing "A Unified Software/ Hardware Framework of DNN Computation and Storage Reduction Using ADMM." The project aims to address the challenges when mapping complicated Deep Neural Network models into hardware for energyefficient and performance-driven implementations needed by ubiquitous embedded and internet of things devices.





Professor **Dagmar Sternad** has been promoted to the rank of University Distinguished Professor, the highest honor the university can bestow upon a faculty member, for her achievements in the field of experimental and computational motor neuroscience.





Professor **Deniz Erdogmus** is a co-principal investigator for a \$1M National Institutes of Health grant, in collaboration with the

University of Southern California, for a "Multimodal Signal Analysis and Data Fusion for Post-Traumatic Epilepsy." Erdogmus is also co-Pl of a \$600K National Science Foundation grant with Bioengineering Affiliated Professors Mary Jo Ondrechen (Pl) and Penny Beuning (co-Pl) for "Mining for Mechanistic Information to Predict Protein Function." Associate Professor **Kaushik Chowdhury** (PI) along with Assistant Professor **Stratis Ioannidis**,



William Lincoln Smith Chair Professor **Tommaso Melodia**, and Professor **Jennifer Dy**, received a \$1.5M DARPA award to work on identifying unique radios using machine learning to identify their hardware signatures. The program aims to develop new methodologies and machine learning architectures that can correctly classify 10,000 devices with an accuracy of 99%.



Professor Hossein Mosallaei was awarded a \$600K Air Force Office of Scientific Research (AFOSR) grant for "On-

Demand Controllable Photonic Processors and Networks." He was also awarded a \$500K NASA grant for Optical Links for Space. In addition, his article published in *Applied Physics Letters* on "Neural Network Based Design of Metagratings" was selected as Editor's Pick.



COE Distinguished Professor **David Kaeli** has received a \$753K DARPA Software-Defined Hardware TA-2 grant, titled

"Mitchell," as part of a threepartner team to design a state-ofthe-art domain-specific language for computationally challenging applications as well as develop supporting compiler/binaryoptimization technology, with the goal for Mitchell to enable Intel's reconfigurable processors to achieve ASIC-like performance.



Associate Professor **Jose Martinez-Lorenzo** (PI), mechanical and industrial engineering (MIE) and electrical and computer

engineering (ECE), along with ECE Professor **Tommaso Melodia**, ECE Associate Professor **Kaushik Chowdhury**, ECE/MIE Professor **Hanumant Singh**, and ECE Affiliated Faculty **Chris Amato** were awarded a \$1.5M Air Force Research Laboratory (AFRL) grant for "Robust Decentralized Classification and Coordination Algorithms for Swarms of Small Unmanned Aerial Systems."

Professor **Nian Sun**, Associate Professor **Marvin Onabajo**, and Assistant Professor Aatmesh Shrivastava were awarded a \$1.3M National Institutes of Health collaborative grant with Massachusetts General Hospital to work on nano-scale neural radio frequency identification (NanoNeuroRFID) devices for wireless neural magnetic modulation and recording.





Assistant Professor **Devesh Tiwari** was awarded a \$500K grant from the National

Science Foundation for "REYAZ: Reliability-Aware Job Scheduling for HPC Systems." REYAZ will enable two novel capabilities: a reliability-aware job scheduling approach and a family of techniques to reduce the input/ output overhead.



STUDENT HONORS AND AWARDS

Isaac Kresse, E/S'19, who graduated with both a chemistry and computer engineering degree, was awarded a Fulbright Fellowship, which he will use to conduct research on proteins in the brain at the Max Planck Institute of Biochemistry in Munich.



A group of Northeastern students, led by Associate Professor **Taskin Padir**, was selected as one of ten finalists in NASA's 2019 Revolutionary Aerospace Systems Concepts – Academic Linkage (RASC-AL) Special Edition: Moon to Mars Ice and Prospecting Challenge for their project "Northeastern University Prospecting Underground Distilling Liquid Extractor (NU-PUDLE)."



Mo Han, PhD'22, Yagmur Gunay, PhD'21, and Ilkay Yildiz, PhD'22 received the Best Student Paper Award at the PErvasive Technologies Related to Assistive Environments (PETRA) conference, which took place in Rhodes, Greece, for their paper "From Handperspective Visual Information to Grasp Type Probabilities: Deep Learning via Ranking Labels."



Dell EMC was issued a U.S. patent for an innovation that **Yifan Sun**, PhD'20, computer engineering, invented while on co-op at the company, and two other patent

applications are pending. A recipient of Northeastern's Outstanding Graduate Student Award for Experiential Learning, Sun developed a method to enable multiple clients to use the same graphics processing unit simultaneously. In addition to Dell EMC, Sun did a co-op at AMD and received a full time job offer upon graduation.

The **Paradigm Hyperloop** team, an international team of students from Northeastern University and Memorial University of Newfoundland & Labrador, placed eighth in the world, and third in North America at the 2019 SpaceX Hyperloop competition in California.



FACULTY BY RESEARCH AREAS

Computer Networks & Security	Stefano Basagni Kaushik Chowdhury Yunsi Fei	Engin Kirda Tommaso Melodia Wil Robertson	
Communications, Control & Signal Processing	Kaushik Chowdhury Pau Closas Jennifer Dy Deniz Erdogmus Yun Raymond Fu Vinay Ingle Stratis Ioannidis Josep Jornet Hanoch Lev-Ari Jose Martinez Lorenzo	Tommaso Melodia Sarah Ostadabbas Purnima Ratilal-Makris Masoud Salehi Bahram Shafai Milad Siami Hanumant Singh Rifat Sipahi	
Computer Systems & Software	Yunsi Fei David Kaeli Mieczyslaw Kokar Miriam Leeser Xue Lin Fabrizio Lombardi	Ningfang Mi Gunar Schirner Devesh Tiwari Yanzhi Wang Edmund Yeh	
Computer Vision, Machine Learning, & Algorithms	Octavia Camps Jennifer Dy Deniz Erdogmus Yun Raymond Fu Stratis Ioannidis Jose Martinez Lorenzo	Waleed Meleis Sarah Ostadabbas Milad Siami Hao Sun Yanzhi Wang	
Electromagnetics, Plasma, & Optics	Charles DiMarzio Vincent G. Harris Yongmin Liu Edwin Marengo Jose Martinez Lorenzo	Carey Rappaport Purnima Ratilal-Makris Michael B. Silevitch Nian X. Sun	
Microsystems, Materials & Devices	Cristian Cassella Hui Fang Yong-Bin Kim Nicol McGruer Marvin Onabajo	Matteo Rinaldi Aatmesh Shrivastava Nian Sun Srinivas Tadigadapa	
Power Electronics, Systems & Controls	Ali Abur Mahshid Amirabadi Bradley Lehman Bahram Shafai	Milad Siami Eduardo Sontag Mario Sznaier	
Robotics	Jose Martinez Lorenzo Taskin Padir Alireza Ramezani Bahram Shafai	Milad Siami Hanumant Singh Rifat Sipahi	

ALI ABUR



Professor, Electrical and Computer Engineering

PhD, Ohio State University, 1985 coe.northeastern.edu/people/abur-ali

Scholarship focus: power system monitoring, estimation and optimization, didentification in power gride

fault location, and identification in power grids

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

P. Ren, A. Abur

Avoiding Divergence in Multi-Area State Estimation, IEEE Transactions on Power Systems, 34(4), 2019, 3178-3187

C. Xu, A. Abur

A Fast and Robust Linear State Estimator for Very Large Scale Interconnected Power Grids, IEEE Transactions on Smart Grid, 9(5), 2018, 4975-4982

A. Öner, A. Abur

Improving Resiliency of Power Grids during Extreme Events, 2018 North American Power Symposium (NAPS), Fargo, ND, 2018, 1-5

Y. Lin, A. Abur

Robust State Estimation Against Measurement and Network Parameter Errors, IEEE Transactions on Power Systems, 33(5), 2018, 4751-4759

Y. Lin, A. Abur

Strategic Use of Synchronized Phasor Measurements to Improve Network Parameter Error Detection, IEEE Transactions on Smart Grid, 9(5), 2018, 5281-5290

P. Ren, H. Lev-Ari, A. Abur

Tracking Three-Phase Untransposed Transmission Line Parameters Using Synchronized Measurements, IEEE Transactions on Power Systems, 33(4), 2018, 4155-4163

SELECTED RESEARCH PROJECTS

Engineering Research Center for Ultra-Wide Area Resilient Electric Energy Transmission Network

Co-Principal Investigator, National Science Foundation

CRISP: Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response

Co-Investigator, National Science Foundation

Robust Distributed State Estimator for Interconnected Transmission and Distribution Networks

Principal Investigator, Department of Energy

MAHSHID AMIRABADI



Assistant Professor, Electrical and Computer Engineering

PhD, Texas A&M University, 2013 coe.northeastern.edu/people/ amirabadi-mahshid

Scholarship focus: design, modeling and control of power converters, power

electronics for renewable energy systems, microgrids, variable speed drives, and wireless power transfer

Honors and awards: Best Paper Award, Energy Conversion Congress and Exposition 2016

SELECTED PUBLICATIONS

- M. Khodabandeh, E. Afshari, M. Amirabadi A Family of Ćuk, Zeta, and SEPIC Based Soft-Switching DC-DC Converters, IEEE Transactions on Power Electronics, 34(10), 2019, 9503-9519
- K. Mozaffari, M. Amirabadi

A Highly Reliable and Efficient Class of Single-Stage High-Frequency AC-Link Converters, IEEE Transactions on Power Electronics, 34(9), 2019, 8435-8452

- E. Afshari, M. Khodabandeh, M. Amirabadi A Single-Stage Capacitive AC-Link AC-AC Power Converter, IEEE Transactions on Power Electronics, 34(3), 2019, 2104-2118
- M. Khodabandeh, E. Afshari, M. Amirabadi A Single-Stage Soft-Switching High-Frequency AC-Link PV Inverter: Design, Analysis, and Evaluation of Si-Based and SiC-Based Prototypes, IEEE Transactions on Power Electronics, 34(3), 2019, 2312-2326
- K. Mozaffari, M. Amirabadi

A Versatile Family of Partial-Resonance Inductive-AC-Link Universal Converters, IEEE Transactions on Power Electronics, 34(8), 2019, 7292-7309

K. Mozaffari, M. Amirabadi, Y. Deshpande A Single-Phase Inverter/Rectifier Topology With Suppressed Double-Frequency Ripple, IEEE Transactions on Power Electronics, 33(11), 2018, 9282-9295

SELECTED RESEARCH PROJECTS

A New Class of Modular Power Converters for Next-Generation Shipboard Power Systems Principal Investigator, Office of Naval Research

A Universal Converter for DC, Single-Phase AC, and Multi-Phase AC Systems

Principal Investigator, Advanced Research Projects Agency-Energy

STEFANO BASAGNI



Associate Professor, Electrical and Computer Engineering

PhD, University of Texas, Dallas, 2001 PhD, University of Milan, Italy, 1998 coe.northeastern.edu/people/basagnistefano

Scholarship focus: wireless networks, ad hoc networks, underwater and terrestrial sensor networking, and protocol design and testing

Honors and awards: Distinguished Scientist of the Association for Computing Machinery

SELECTED PUBLICATIONS

V. Di Valerio, F. Lo Presti, C. Petrioli, L. Picari, D. Spaccini, S. Basagni

CARMA: Channel-Aware Reinforcement Learning-Based Multi-Path Adaptive Routing for Underwater Wire-Less Sensor Networks, IEEE Journal on Selected Area in Communications. Special issue on Machine Learning in Wireless Communications, 2019, 1–13

M. Tehrani Moayyed, B. Antonescu, S. Basagni Clustering Validation for mmWave Multipath Components in Outdoor Transmissions, Proceedings of Wireless Days, 2019, 1–8

S. Basagni, V. Di Valerio, P. Gjanci, C. Petrioli MARLIN-Q: Multi-Modal Communica- tions for Reliable and Low-Latency Underwater Data Delivery, Ad Hoc Networks, (82), 2019, 134–145

S. Basagni, F. Ceccarelli, C. Petrioli, N. Raman, A.V. Sheshashayee

Wake-up Radio Ranges: A Performance Study, Proceedings of IEEE WCNC 2019, 1–5, Marrakech, Morocco, April 15–19

A.V. Sheshashayee, S. Basagni

WiLE: Leader Election in Wireless Networks, Ad Hoc & Sensor Wireless Networks, 44(1–2), 2019, 1–23

SELECTED RESEARCH PROJECTS

MRI: SEANet: Development of a Software-Defined Networking Testbed for the Internet of Underwater Things Co-Principal Investigator, National Science Foundation

Platforms for Advanced Wireless Research Project Office Co-Principal Investigator, National Science Foundation

PROTECT: A Millimeter-Wave Programmable Radio platfOrm and Tactical WirelEss Communication Testbed Co-Principal Investigator, Office of Naval Research

OCTAVIA CAMPS



Professor, Electrical and Computer Engineering

PhD, University of Washington, 1992 coe.northeastern.edu/people/campsoctavia

Scholarship focus: computer Vision, Machine Learning, Artificial Intelligence

and Image Processing

SELECTED PUBLICATIONS

S. Karanam, M. Gou, Z. Wu, A. Rates-Borras, O.I. Camps, R.J. Radke

A Systematic Evaluation and Benchmark for Person Re-Identification: Features, Metrics and Datasets, IEEE Transactions on Pattern Analysis and Machine Intelligence, 41(3), 2019, 523-536

- L. Wenqian, A. Sharma, O.I. Camps, M. Sznaier DYAN: A Dynamical Atoms-Based Network For Video Prediction, Proceedings of the European Conference on Computer Vision (ECCV), 2018, 170-185
- M. Gou, F. Xiong, O.I. Camps, M. Sznaier MoNet: Moments Embedding Network, In Proceedings 2018 IEEE Conference on Computer Vision and Pattern Recog. (CVPR), Salt Lake City, Utah, 2018

M. Sznaier, O.I. Camps

SoS-RSC: A Sum-of-Squares Polynomial Approach to Robustifying Subspace Clustering Algorithms, In Proceedings 2018 IEEE Conference on Computer Vision and Pattern Recog. (CVPR), Salt Lake City, Utah, 2018 K. Kose, M. Gou, O. Yelamos, M. Cordova, A.M. Rossi, K.S. Nehal, E.S. Flores, O.I. Camps, J. Dy, D.H. Brooks, M. Rajadhyaksha

Automated Video-Mosaicking Approach for Confocal Microscopic Imaging In Vivo: An Approach to Address Challenges in Imaging Living Tissue and Extend Field of View, Scientific Reports, Nature, 7(1), 2017, 10759

SELECTED RESEARCH PROJECTS

Collaborative Research: Data Driven Control of Switched Systems with Applications to Human Behavioral Modification

Co-Principal Investigator, National Science Foundation

Confocal Video-Mosaicking Microscopy to Guide Surgery of Superficially Spreading Skin Cancers

Principal Investigator, National Institutes of Health

Dynamic and Statistical Based Invariants on Manifolds for Video Analysis

Principal Investigator, National Science Foundation

CRISTIAN CASSELLA



Assistant Professor, Electrical and Computer Engineering

PhD, Carnegie Mellon University, 2015 coe.northeastern.edu/people/cassellacristian

Scholarship focus: acoustic resonators, nonreciprocal components,

zero-power sensors for IoT, nonlinear dynamics, ultrasonic transducers

Honors and awards: Winner of the Marie Skłodowska-Curie Individual Fellowship

SELECTED PUBLICATIONS

- C. Cassella, J. Segovia-Fernandez High K²/_t Exceeding 6.4% Through Metal Frames in Aluminum Nitride 2-D Mode Resonators, IEEE transactions on Ultrasonics, Ferroelectrics, and Frequency Control 66(5), 2019, 958-964
- J.M. Puder, J.S. Pulskamp, R.R. Rudy, C. Cassella, M. Rinaldi, G. Chen, S. Bhave, R.G. Polcawich Rapid Harmonic Analysis of Piezoelectric MEMS Resonators, IEEE Transactions on Ultrasonic Ferroelectrics, and Frequency Control, 6(65), 2018, 979-990
- G. Chen, C. Cassella, T. Wu, M. Rinaldi Single-Chip Multi-Frequency Wideband Filters Based on Aluminum Nitride Cross-Sectional Lamé Mode Resonators with Thick and Apodized Electrodes, IEEE Micro Electro Mechanical Systems, 2018, 775-778
- B. Gibson, K. Qalandar, C. Cassella, G. Piazza, K. Turner A study on the Effects of Release Area on the Quality Factor of Contour-Mode Resonators by Laser Doppler Vibrometry, IEEE Transaction on Ultrasonics, Ferroelectric and Frequency Control, 5(64), 2017, 898-904
- C. Cassella, S. Strachan, S. Shaw, G. Piazza Phase Noise Suppression Through Parametric Filtering, Applied Physics Letters, 110(6), 2017, 063503

Z. Qian, V. Rajaram, R. Sungho Kang, T. Wu, C. Cassella, N. McGruer, M. Rinaldi

Zero Power Infrared Digitizers Based on Plasmonicallyenhanced Micromechanical Photoswitches, Nature Nanotechnology, 12(10), 2017, 969–973

C. Cassella

Aluminum Nitride Cross-Sectional Lamé Mode Resonators, Journal of Microelectromechanical Systems, 25(2), 2016, 275-285

KAUSHIK CHOWDHURY



Associate Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 2009 coe.northeastern.edu/people/ chowdhury-kaushik

Scholarship focus: dynamic spectrum

access, energy harvesting sensor networks, 5G technology, intra-body communication, and protocol design for wireless

Honors and awards: ONR Director of Research Early Career Award 2016; Chair of the IEEE Technical Committee on Simulation; National Science Foundation CAREER Award 2015

SELECTED PUBLICATIONS

- P. Nguyen, U. Muncuk, A. Ashok, K.R. Chowdhury, et al. Battery-Free Identification Token for Touch Sensing Devices, ACM Conference on Embedded Networked Sensor Systems (SenSys), Stanford, CA, 2016
- R. Doost-Mohammady, M.Y. Naderi, K.R. Chowdhury Performance Analysis of CSMA/CA based Medium Access in Full-Duplex Wireless Communications, IEEE Transactions on Mobile Computing, 15(6), 2016, 1457-1470
- M. Swaminathan, F.S. Cabrera, J.S. Pujol, U. Muncuk, G. Schirner, K.R. Chowdhury
- Multi-Path Model and Sensitivity Analysis for Galvanic Coupled Intra-Body Communication through Layered Tissue, IEEE Transactions on Biomedical Circuits and Systems, 10(2), 2016, 339-351
- M. Swaminathan, U. Muncuk, K.R. Chowdhury Topology Optimization for Galvanic Coupled Wireless Intra-Body Communication, IEEE International Conference on Computer Communications (INFOCOM), San Francisco, 2016
- R.G. Cid-Fuentes, M.Y. Naderi, S. Basagni,
- K.R. Chowdhury, A. Cabellos-Aparicio, E. Alarcón On Signaling Power: Communications Over Wireless Energy, IEEE International Conference on Computer Communications (INFOCOM), San Francisco, 2016

SELECTED RESEARCH PROJECTS

CAREER: Integrated Data and Energy Access for Wireless Sensor Networks

Principal Investigator, National Science Foundation

Cross Layer Approach to 5G Communications Co-Principal Investigator, MathWorks

End-to-End Protocol Designs that Address the Challenges of Distributed Dynamic Spectrum Access Networks Principal Investigator, Office of Naval Research

PAU CLOSAS



Assistant Professor, Electrical and Computer Engineering

PhD, Universitat Politècnica de Catalunya, 2009 coe.northeastern.edu/people/closaspau

Scholarship focus: statistical and array signal processing, estimation and

detection theory, Bayesian inference, stochastic filtering, robust statistics, and game theory, with applications to positioning systems, wireless communications, and mathematical biology

Honors and awards: National Science Foundation CAREER Award, 2019; Duran Farell for Technological Research; EURASIP Best PhD Thesis Award; 2016 Institute of Navigation Early Achievements Award

SELECTED PUBLICATIONS

J. Vilà-Valls, M. Navarro, P. Closas, M. Bertinelli Synchronization Challenges in Deep Space Communications, IEEE Aerospace and Electronic Magazine, 2019, 34(1), 16-27

E. Arias-de-Reyna, P. Closas, D. Dardari, P.M. Djuric Crowd-based Learning of Spatial Fields for the IoT, IEEE Signal Processing Magazine, 35(5), 2018, 130-139

D. Borio, H. Li, P. Closas

Huber's Non-Linearity for GNSS Interference Mitigation, Sensors, 18(7), 2018, 2217

P. Closas, A. Gusi-Amigó Direct Position Estimation of GNSS Receivers, IEEE Signal Processing Magazine, 34(5), 2017, 72-84

J. Vilà-Valls, P. Closas, J.T. Curran Multi-frequency GNSS Robust Carrier Tracking for Ionospheric Scintillation Mitigation, Journal of Space Weather and Space Climate, 7, 2017, A26

M.G. Amin, P. Closas, A. Broumandan, J.L. Volakis Vulnerabilities, Threats, and Authentication in Satellite-Based Navigation Systems [Scanning the Issue], Proceedings of the IEEE, 104(6), 2016, 1169-1173

D. Dardari, P. Closas, P. Djuric Indoor Tracking: Theory, Methods, and Technologies, IEEE Transactions on Vehicular Technology, 64(4), 2015, 1263-1278

SELECTED RESEARCH PROJECTS

CAREER: Secure and Ubiquitous Position, Navigation and Timing

Principal Investigator, National Science Foundation Securing GNSS-Based infrastructures

Principal Investigator, National Science Foundation

CHARLES DIMARZIO



Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering, Mechanical and Industrial Engineering

PhD, Northeastern University, 1996 coe.northeastern.edu/people/ dimarzio-charles

Scholarship focus: optics, microscopy, coherent detection, interaction of light and sound waves hyperspectral imaging, diffusive optical tomography and ultrasound, lidar and remote sensing, multi-model imaging, Activities include: computer modeling, designing, building and testing of hardware, and processing the resulting data

SELECTED PUBLICATIONS

A.E. Draghici, D. Potart, J.L. Hollmann, V. Pera, Q. Fang, C.A. DiMarzio, J.A. Taylor, M.J. Niedre, S.J. Shefelbine

Near Infrared Spectroscopy for Measuring Changes in Bone Hemoglobin Content after Exercise in Individuals with Spinal Cord Injury, Journal of Orthopaedic Research, 2017

Z.R. Hoffman, C.A. DiMarzio

Single-Image Structured Illumination Using Hilbert Transform Demodulation, Journal of Biomedical Optics, 22(5), 2017, 056011–056011

Z.R. Hoffman, C.A. DiMarzio

Super-Resolution Structured Illumination in Optically Thick Specimens Without Fluorescent Tagging,

Journal of Biomedical Optics, 22(11), 2017, 1-11

A. Vakili, J.L. Hollmann, R.G. Holt, C.A. DiMarzio Enhanced Tagging of Light Utilizing Acoustic Radiation Force with Speckle Pattern Analysis, Journal of Biomedical optics, 22(10), 2017, 106004

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A. DiMarzio Diffusion Model for Ultrasound-Modulated Light, Journal of Biomedical Optics, 19(3), 2014, 035005

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A. DiMarzio Analysis and Modeling of an Ultrasound-Modulated Guide Star to Increase the Depth of Focusing in a Turbid Medium, Journal of Biomedical Optics, 18(2), 2013, 025004

SELECTED RESEARCH PROJECTS

Coded-Illumination Fourier Ptychography for High-Content MultiModal Imaging

Principal Investigator, National Science Foundation

Light Scattering Research Principal Investigator, Draper Labs

JENNIFER DY



Professor, Electrical and Computer Engineering

PhD, Purdue University, 2001 coe.northeastern.edu/people/dyjennifer

Scholarship focus: machine learning, data mining, statistical pattern

recognition, computer vision, and image processing

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

S.M. Brown, A. Webb, R.S. Mangoubi, J.G. Dy

A Sparse Combined Regression-classification Formulation for Learning a Physiological Alternative to Clinical Post-Traumatic Stress Disorder Scores, Twentyninth AAAI Conference on Artificial Intelligence, 2015

J. Ross, P. Castaldi, M. Cho, J.G. Dy

Dual Beta Process Priors for Latent Cluster Discovery in Chronic Obstructive Pulmonary Disease, ACM SIGKDD Knowledge Discovery and Data Mining, 2014

D. Niu, J.G. Dy, M.I. Jordan Iterative Discovery of Multiple Alternative Clustering Views, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(7), 2014, 1340-1353

Y. Yan, R. Rosales, G. Fung, J.G. Dy Active Learning from Crowds, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1161-1168

Y. Guan, J.G. Dy, M.I. Jordan

A Unified Probabilistic Model for Global and Local Unsupervised Feature Selection, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1073-1080

M. Masaeli, G. Fung, J.G. Dy

From Transformation-Based Dimensionality Reduction to Feature Selection, Proceedings of the 27th International Conference on Machine Learning (ICML), 2010, 751-758

SELECTED RESEARCH PROJECTS

Automated Image Guidance for Diagnosing Skin Cancer With Confocal Microscopy

Principal Investigator, National Institutes of Health

Genetic Epidemiology of COPD

Co-Principal Investigator, National Institutes of Health

Spatio-Temporal Extremes and Associations Marine Adaptation and Survivorship under Climate Change and Rising Ocean Temperatures

Principal Investigator, National Science Foundation

DENIZ ERDOGMUS



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Florida, 2002 coe.northeastern.edu/people/ erdogmus-deniz

Scholarship focus: machine learning, signal and image analytics, cyber-human systems

Honors and awards: National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

P. Gonzalez-Navarro, Y.M. Marghi, B. Azari, M. Akcakaya, D. Erdogmus

An Event-Driven AR-Process Model with Rapid Trial Sequences for EEG-Based BCIs, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2019, 798-804

O. Ozdenizci, D. Erdogmus

Information Theoretic Feature Transformation Learning for Brain Interfaces, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 2019

- S. Salehi, S. Khan, D. Erdogmus, A. Gholipour Real-Time Deep Pose Estimation With Geodesic Loss for Image-to-Template Rigid Registration, IEEE Transactions on Medical Imaging, 38(2), 2019, 470-481
- A. Kocanaogullari, Y.M. Marghi, M. Akcakaya, D. Erdogmus

Optimal Query Selection Using Multi-Armed Bandits, IEEE Signal Processing Letters, 25(12), 2018, 1870–1874

SELECTED RESEARCH PROJECTS

Autism Inpatient Collection Phase III Co-Investigator, Simons Foundation Autism Research Initiative

Collaborative Research: Assistive Integrative Support Tool for Retinopathy of Prematurity

Principal Investigator, National Science Foundation

Collaborative Research: EEG-guided Electrical Stimulation for Immersive Virtual Reality

Co-Principal Investigator, National Science Foundation

Collaborative Research: Nested Control of Assistive Robots Through Human Intent Inference

Principal Investigator, National Science Foundation

Collaborative Research: Understanding Motor Cortical Organization Through Engineering Innovation to TMSbased Brain Mapping

Co-Principal Investigator, National Science Foundation

HUI FANG



Assistant Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering and Mechanical and Industrial Engineering

PhD, University of California, Berkeley, 2014 coe.northeastern.edu/people/fang-hui

Scholarship focus: nano-electronics, bio-electronics, materials surfaces and interfaces

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

Y. Qiang, P. Artoni, K.J. Seo, S. Culaclii, V. Hogan, X. Zhao, Y. Zhong, X. Han, P.-M. Wang, Y.-K. Lo, Y. Li, H. A. Patel, Y. Huang, A. Sambangi, J.S. V. Chu, W. Liu, M. Fagiolini, H. Fang

Transparent Arrays of Bilayer-Nanomesh Microelectrodes for Simultaneous Electrophysiology and 2-Photon Imaging in the Brain, Science Advances, 4(9), 2018, eaat0626

H. Fang, K.J. Yu, C. Gloschat, Z. Yang, E. Song, C.H. Chiang, J. Zhao, S.M. Won, S. Xu, M. Trumpis, Y. Zhong, S.W. Han, Y. Xue, D. Xu, S.W. Choi, G. Cauwenberghs, M. Kay, Y. Huang, J. Viventi, I.R. Efimov, J.A. Rogers Capacitively Coupled Arrays of Multiplexed Flexible Silicon Transistors for Long-Term Cardiac Electrophysiology, Nature Biomedical Engineering, 1, 2017, 0038

H. Fang, C. Battaglia, C. Carraro, S. Nemsak, B. Ozdol, J.S. Kang, H.A. Bechtel, S.B. Desai, et. al

Strong Interlayer Coupling In Van Der Waals Heterostructures Built From Single-Layer Chalcogenides, Proceedings of the National Academy of Sciences, 111, 2014, 6198-6202

SELECTED RESEARCH PROJECTS

Transforming Neural Interfaces Using Stretchable, Transparent, Multifunctional Nanomesh Microelectrodes Principal Investigator, National Science Foundation

Transfer Printed, Single-Crystalline Si Nanomesh Thin Films

Principal Investigator, National Science Foundation

YUNSI FEI



Professor, Electrical and Computer Engineering

PhD, Princeton University, 2004 coe.northeastern.edu/people/fei-yunsi

Scholarship focus: computer architecture, embedded systems, hardware-oriented security, design

automation, mobile computing, and underwater sensor networks

Honors and awards: National Science Foundation CAREER Award; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

P. Zhao, S. Wang, C. Gongye, Y. Wang, Y. Fei, X. Lin Fault Sneaking Attack: A stealthy Framework for Misleading Deep Neural Networks, IEEE Design Automation Conf. (DAC), 2019

P. Luo, K. Athanasiou, Y. Fei, T. Wahl Algebraic Fault Analysis of SHA-3 Under Relaxed Fault Models, IEEE Trans. on Information Forensics and Security, 13(7), 2018

C. Luo, Y. Fei, D. Kaeli Effective Simple-Power Analysis Attacks of Elliptic Curve Cryptography on Embedded Systems, ACM Int. Conf. Computer-Aided Design (ICCAD), 2018

C. Luo, Y. Fei, D. Kaeli GPU Acceleration of RSA is Vulnerable to Side-Channel Timing Attacks, ACM Int. Conf. Computer-Aided Design (ICCAD), 2018

M. Sabbagh, Y. Fei, T. Wahl, A. Ding SCADET: A side-Channel Attack Detection Tool for Tracking Prime+Probe, ACM International Conference Computer-Aided Design (ICCAD), 2018

SELECTED RESEARCH PROJECTS

Embedded Hardware-Based Security and Side Channel Analysis

Principal Investigator, Analog Devices

Protecting Confidentiality and Integrity of Deep Neural Networks against Side-Channel and Fault Attacks Principal Investigator, National Science Foundation

STARSS: Side-Channel Analysis and Resiliency Targeting Accelerators

Co-Principal Investigator, National Science Foundation and Semiconductor Research Corporation

Automating Countermeasures and Security Evaluation Against Software Side-Channel Attacks

Principal Investigator, National Science Foundation

YUN RAYMOND FU



Professor, Electrical and Computer Engineering; jointly appointed, **Computer Science**

PhD, University of Illinois, 2008 coe.northeastern.edu/people/fu-yun

Scholarship focus: machine learning and computational intelligence, social media analytics, human-computer

interaction, and cyber-physical systems

Honors and awards: IEEE Fellow; OSA Fellow; SPIE Fellow; IAPR Fellow; Office of Naval Research Young Investigator Award; Army Research Office Young Investigator Award; International Neural Network Society's Young Investigator Award; IEEE CIS Outstanding Early Career Award; ACM Future of Computing Academy Member; Søren Buus **Outstanding Research Award**

SELECTED PUBLICATIONS

H. Liu, Z.G. Tao, Y. Fu

Partition Level Constrained Clustering, IEEE Transactions on Pattern Analysis and Machine Intelligence, 2018

- S. Li, M. Shao, Y. Fu Person Re-Identication by Cross-View Multi-Level Dictionary Learning, IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2018
- K. Li, Z. Wu, K.C. Peng, J. Ernst, Y. Fu Tell Me Where To Look: Guided Attention Inference Network, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
- J.P. Robinson, M. Shao, Y. Wu, H. Liu, T. Gillis, Y. Fu Visual Kinship Recognition of Families In the Wild (FIW), IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI), 2018

SELECTED RESEARCH PROJECTS

EAGER: Vision-Based Activity Forecasting by Mining **Temporal Causalities**

Principal Investigator, National Science Foundation

Deeply Learned Visual Commonsense and Its Applications Principal Investigator, Samsung Global Research Outreach

Deep Structures Boosted Self-Organized Behavior Pattern Learning for Anomaly Detection

Principal Investigator, Office of Naval Research

VINCENT G. HARRIS



University Distinguished Professor, William Lincoln Smith Professor, Electrical and Computer Engineering; affiliated faculty, Chemical Engineering

PhD, Northeastern University, 1990 coe.northeastern.edu/people/harrisvincent

Scholarship focus: design and

processing of advanced materials with emphasis on high frequency device applications for radar, communication, and sensing

Honors and awards: Fellow, Fulbright; Fellow, American Association for the Advancement of Science, Distinguished Scientist Award, The Materials, Minerals, and Metals Society; Fellow, Institute of Electrical and Electronics Engineers; Fellow, American Physical Society; Fellow, Institute of Physics; Fellow, Institute of Engineering and Technology; Institute of Metal Research's Lee Hsun Lecture Award; Fulbright Senior Fellow; Søren Buus Outstanding; Research Award, College of Engineering

SELECTED PUBLICATIONS

P. Andalib, Y. Chen, V.G. Harris

Concurrent Core Loss Suppression and High Permeability by Introduction of Highly Insulating Intergranular Magnetic Inclusions to MnZn Ferrite, IEEE Magnetics Letters, 9, 2018

Z. Zheng, Q. Feng, Y. Chen, V.G. Harris

High-Frequency Magnetic Properties of Ca-Substituted Co₂Z and Co₂W Barium Hexaferrite Composites, IEEE Transactions on Magnetics, 54 (6), 2018, 1-6

V.G. Harris, V. Šepelák

Mechanochemically Processed Zinc Ferrite Nanoparticles: Evolution of Structure and Impact of Induced Cation Inversion, Journal of Magnetism and Magnetic Materials, 465, 2018, 603-610

G. Li, Y. Chen, V.G. Harris

Particle-Size Distribution Modified Effective Medium Theory and Validation by Magneto-Dielectric Co-Ti Substituted BaM Ferrite Composites, Journal of Magnetism and Magnetic Materials, 453, 2018, 44-47

SELECTED RESEARCH PROJECTS

Accelerated Development of Magnetodielectrics Having Equivalent Permeability and Permittivity for **RF** Applications

Principal Investigator, Rogers Corp

Magnetodielectric Heterostructures and Composites Principal Investigator, Rogers Corp

MAgnetics on GaN for Next GEneration T/R Systems Principal Investigator, Defense Advanced Research Projects Agency, Subaward from Qorvo

Nonlinear Properties of Ferrite Materials

VINAY INGLE



Associate Professor, Electrical and Computer Engineering

PhD, Rensselaer Polytechnic Institute, 1981 coe.northeastern.edu/people/inglevinaykumar

Scholarship focus: multidimensional signal processing and hyperspectral imaging

SELECTED PUBLICATIONS

D. Manolakis, N. Bosowski, V. Ingle Count Time Series Analysis: A signal processing Perspective, IEEE Signal Processing Magazine, 36(3), 2019

M. Pieper, V. Ingle, D. Manolakis Sensitivity of Temperature and Emissivity Separation to Atmospheric Errors in LWIR Hyperspectral Imagery, SPIE Conference on Algorithms and Technologies for Multispectral, Hyperspectral, and Ultraspectral Imagery XXIV, SPIE 2018 Defense + Security, 2018

M. Pieper, D. Manolakis, E. Truslow, T. Cooley,

M. Brueggeman, J. Jacobson, A. Weisner, V. Ingle Effects of Wavelength Calibration Mismatch on Temperature-Emissivity Separation Techniques, IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 11, 2018, 57-67

V. Ingle, J. Proakis Digital Signal Processing Using MATLAB, Cengage Learning, Fourth Edition, 2017

SELECTED RESEARCH PROJECTS

Algorithms for Threat Detection Principal Investigator, MIT Lincoln Lab

Anamoly Detection in Sequential Image Frames using Low-Rank Modeling

Principal Investigator, Massachusetts Institute of Technology Lincoln Lab

Investigation of Hyperspectral Target Detection Algorithms Principal Investigator, MIT Lincoln Lab

Performance Modeling and Prediction for LWIR Hyperspectral Target Detection Systems Principal Investigator, Massachusetts Institute of Technology Lincoln Lab Assistant Professor, Electrical and Computer Engineering

STRATIS IOANNIDIS

PhD, University of Toronto, 2009 coe.northeastern.edu/people/ ioannidis-stratis

Scholarship focus: distributed systems, networking, machine learning,

big data, and privacy

SELECTED PUBLICATIONS

Y. Guo, J. Dy, D. Erdoğmuş, J. Kalpathy-Cramer, S. Ostmo, J. P. Campbell, M.F. Chiang, S. Ioannidis Accelerated Experimental Design for Pairwise Comparisons, SDM, 2019

P. Tian, Y. Guo, J. Brown, J. Kalpathy-Cramer, S. Ostmo, J.P. Campbell, M.F. Chiang, J. Dy, D. Erdoğmuş, S. Ioannidis A Severity Score for Retinopathy of Prematurity,

KDD, 2019 I. Yıldız, P. Tian, J. Dy, D. Erdoğmuş, J. Brown, J. Kalpathy-Cramer, S. Ostmo, J. P. Campbell, M. F. Chiang, S. Ioannidis

Classification and Comparison via Neural Networks, Elsevier Journal of Neural Networks, 2019

- M. Mahdian, A. Moharrer, S. Ioannidis, E. Yeh Kelly Cache Networks, INFOCOM, 2019
- J. Bento, S. Ioannidis A Family of Tractable Graph Distances, SDM, 2018
- A. Moharrer, S. Ioannidis Distributing Frank-Wolfe via Map-Reduce, Knowledge and Information Systems Journal, 2018

SELECTED RESEARCH PROJECTS

Assistive Integrative Support Tool for Retinopathy of Prematurity

Principal Investigator, National Science Foundation Caching Networks with Optimality Guarantees

Principal Investigator, National Science Foundation

CAREER: Leveraging Sparsity in Massively Distributed Optimization

Principal Investigator, National Science Foundation Deep Learning Convolutional Neural Networks for

Radio Identification

Co-Principal Investigator, Defence Advanced Research Projects Agency

Design and Computation of Scalable Graph Distances in Metric Spaces: A Unified Multiscale Interpretable Perspective Principal Investigator, National Science Foundation

Massively Scalable Secure Computation Infrastructure Using FPGAs

Principal Investigator, National Science Foundation

JOSEP M. JORNET



Associate Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 2013 coe.northeastern.edu/people/jornetjosep

Scholarship focus: terahertz

communications, Wireless nano-bio-communication networks, Internet of Nano-Things

SELECTED PUBLICATIONS

Q. Xia, J.M. Jornet

Expedited Neighbor Discovery in Directional Terahertz Communication Net- Works Enhanced by Antenna Side-lobe Information, IEEE Transactions on Vehicular Technology, 2019

J.M. Jornet, Y. Bae, C. Handelmann, B. Decker, A. Balcerak, A. Sangwan, P. Miao, A. Desai, L. Feng, E.K. Stachowiak, M.K. Stachowiak

Optogenomic Interfaces: Bridging Biological Networks with the Electronic Digital World, Proceedings of the IEEE, 2019

Z. Hossain, C. Mollica, J. Federici, J.M. Jornet Stochastic Interference Modeling and Experimental Validation for Pulse-based Terahertz Communication, IEEE Transactions on Wireless Communications, 99, 2019

J. Ma, R. Shrestha, J. Adelberg, C.-Y. Yeh, Z. Hossain, E. Knightly, J.M. Jornet, D.M. Mittleman

Security and Eavesdropping in Terahertz Wireless Links, Nature, 563(7729), 2018, 89-93

SELECTED RESEARCH PROJECTS

CAREER: Realizing Ultra-Broadband Terahertz Communication Networks

Principal Investigator, National Science Foundation Collaborative Research: Scaling WLANs in Spectrum, User Density, and Robustness

Co- Principal Investigator, National Science Foundation

An Integrated Testbed for True Terahertz Communications Principal Investigator, National Science Foundation

Enabling Frequency-Agile Ultra-Broadband Airborne Networks in the THz Band

Principal Investigator, Air Force Research Lab

Networked Nanophotonic Devices for Stem Cell Regulation: From Optogenetics to Optogenomics Principal Investigator, National Science Foundation

DAVID KAELI



COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Rutgers University, 1992 coe.northeastern.edu/people/kaelidavid

Scholarship focus: computer

architecture, GPUs, heterogeneous computing, performance analysis, security and information assurance, hardware reliability and recovery, big data analytics, workload characterization

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Distinguished Scientist, Associate of Computing Machinery; Distinguish Professor, Heterogeneous Systems Architecture Foundation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

F.F.D. Santos, P.F. Pimento, C.B. Lunardi, L. Draghetti, L. Carro, D. Kaeli, P. Rech Analyzing and Increasing the Reliability of Convolutional Neural Networks on GPUs, IEEE Transactions on Reliability, 68(2), 2019, 663-677

L. Wang, X. Zhao, D. Kaeli, Z. Wang, L. Eeckhout Intra-Cluster Coalescing and Distributed-Block Scheduling to Reduce GPU NoC Pressure, IEEE Transactions on Computers, 68(7), 2019, 1064-1076

Y. Sun, T. Baruah, S. A. Mojumder, S. Dong, X. Gong, S. Treadway, Y. Bao, S. Hance, C. McCardwell, V. Zhao, H. Barclay, A.K. Ziabari, Z. Chen, R. Ubal, J.L. Abellán, J. Kim, A. Joshi, D. Kaeli

MGPUSim: Enabling Multi-GPU Performance Modeling and Optimization, Proceedings of the 46th International Symposium on Computer Architecture (ISCA '19), ACM, New York, NY, USA, 2019, 197-209

SELECTED RESEARCH PROJECTS

A Framework of Simultaneous Acceleration and Storage Reduction on Deep Neural Networks Using Structured Matrices

Co-Principal Investigator, National Science Foundation

Exploring Analysis of Environment and Health Through Multiple Alternative Clustering

Co-Principal Investigator, National Science Foundation

Leveraging Intra-Chip/Inter-Chip Silicon Photonic Networks for Designing Next-Generation Accelerators Principal Investigator, National Science Foundation

TA2: Dynamic Hardware/Software Compilers for High-Level Languages

Principal Investigator, Defense Advanced Research Projects Agency Software-Defined Hardware Program

YONG-BIN KIM



Professor, Electrical and Computer Engineering

PhD, Colorado State University, 1996 coe.northeastern.edu/people/kimyong-bin

Scholarship focus: integrated circuit design and for nanoelectronics and

nano technology, high speed system integration for signal processing and communication applications, bio-chip and bio-sensor interface circuit design, electronic neuron circuit design, low power adaptive robot controller circuit design; high performance and low power VLSI design, system-on-chip (soc), and Physical VLSI CAD

SELECTED PUBLICATIONS

G. Jeon, Y.-B. Kim

A 4Gb/s Half-Rate DFE with Switched-Cap and IIR Summation for Data Correction, IEEE International Symposium on Circuits and Systems, Baltimore, MD, 2017, 2392-2395

G. Jeon, Y.-B. Kim

Area Ecient 4GB/s Clock Data Recovery Using Improved Phase Interpolator with Error Monitor, 2018 IEEE International Midwest Symposium on Circuits and Systems on Circuits and Systems (MWSCAS), Windsor, Canada, 2018, 206-209

Y. Choi, G. Jeon, Y.-B. Kim, H.K. Jung

Transceiver Design for LVSTL Signal Interface with a Low Power On-Chip Self Calibration Scheme, Elseviere Integration the VLSI Journal, 63, 2018, 148-159

G. Jeon, Y.-B. Kim

Switched Capacitor and Infinite Impulse Response Summation for a Quad-Rate DFE 4Gb/s Data Rate, ACM GLSVLSI Conference, Banff, Alberta, Canada, 2017, 439-442

H. Zhu, W. Yang, G. Engel, Y.-B. Kim

A Two-Parameter Calibration Technique Tracking Temperature Variations for Current Source Miamatch in DACs, IEEE Transactions on Circuits and Systems II, 64(4), 2017, 387-391

W. Wei, K. Namba, F. Lombardi, Y.-B. Kim A Novel Scheme for Tolerating Single Event/Multiple

Bit Upsets (SEU/MBU) in Non-Volatile Memories, IEEE Transactions on Computers, 65(3), 2016, 781-790

SELECTED RESEARCH PROJECTS

Compact and Power Efficient Integrated Voltage Tunable RF Multiferroic Inductors with Wide Tunable Inductance Principal Investigator, Winchester Technology

Semi-Self Calibration of High Speed Transceiver for DRAM Interface

Principal Investigator, Hynix Semiconductor

ENGIN KIRDA



Professor, Electrical and Computer Engineering; jointly appointed, Computer and Information Science

PhD, Technical University of Vienna, 2002 coe.northeastern.edu/people/kirdaengin

Scholarship focus: malware analysis and detection; web security; social network security; reverse engineering; intrusion detection

SELECTED PUBLICATIONS

M. Weissbacher, W. Robertson, E. Kirda, C. Kruegel, G. Vigna

ZigZag: Automatically Hardening Web Applications Against Client-Side Validation Vulnerabilities, In USENIX Security Symposium, Washington DC, 2015

C. Mulliner, W. Robertson, E. Kirda

Hidden GEMs: Automated Discovery of Access Control Vulnerabilities in Graphical User Interfaces, In IEEE Symposium on Security and Privacy (S&P), San Jose, CA, 2014

S. Le Blonde, A. Uritesc, C. Gilbert, Z. Leong Chua, P. Saxena, E. Kirda

Look at Targeted Attacks Through the Lense of an NGO, In USENIX Security Symposium, San Diego, CA, 2014

K. Onarlioglu, C. Mulliner, W. Robertson, E. Kirda PrivExec: Private Execution as an Operating System Service, In IEEE Symposium on Security and Privacy (S&P), San Francisco, CA, 2013

L. Bilge, E. Kirda, C. Kruegel, M. Balduzzi EXPOSURE: Finding Malicious Domains Using Passive DNS Analysis, In Network and Distributed Systems Security Symposium (NDSS) San Diego, CA, 2011

SELECTED RESEARCH PROJECTS

Continuum: Finding Space and Time Vulnerabilities in Java Programs

Co-Principal Investigator, Defense Advanced Research Projects Agency

DarkDroid: Exposing the Dark Side of

Android Marketplaces Principal Investigator, Defense Advanced Research Projects Agency

Firmalice: Modeling and Identifying Malice in Firmware Principal Investigator, Defense Advanced Research Projects Agency

Collaborative: Automated Reverse Engineering of Commodity Software

Co-Principal Investigator, National Science Foundation

MIECZYSLAW KOKAR



Professor, Electrical and Computer Engineering

PhD, Wroclaw University of Technology, 1973 coe.northeastern.edu/people/kokarmieczyslaw

Scholarship focus: cognitive radio; software engineering-self-controlling software; information fusion

SELECTED PUBLICATIONS

S. Lu, M.M. Kokar

A Method to Identify Relevant Information Sufficient to Answer Situation Dependent Queries, In Proceedings of the 2018 IEEE Conference on Cognitive Situation Management, 2018, 22-28

Y. Chen, M. Güngör, S. Singh, A. Tazin, M.M. Kokar, M. Leeser

Dynamic Deployment of Communication Applications to Different Hardware Platforms using Ontological Representations, In 2018 IEEE High Performance Extreme Computing Conference, HPEC 2018, Waltham, MA, USA, 2018, 1-6

J. Moskal, A. Whittington, M. Kokar, B. Abbott Introducing TACL - A Proposal for a New Standard T&E Constraint Language, In Proceedings of the International Telemetering Conference - ITC USA 2018, 1-10

S. Singh, M.M. Kokar

Simulation of Scale-Free Correlation in Swarms of UAVs, In Alfredo J. Morales, Carlos Gershenson, Dan Braha, Ali A. Minai, and Yaneer Bar-Yam, editors, Unifying Themes in Complex Systems IX, 2018, 91-97, Cambridge, MA

J. Moskal, M.M. Kokar, O. Hurez-Martin

Using Standardized Semantic Technologies for Discovery and Invocation of RF-Based Microservices, In Wireless Innovation Forum Conference on Wireless Communications Technologies and Software Defined Radio, 2018, 1-9

Y. Chen, M.M. Kokar, J. Moskal, D. Suresh

Mapping Spectrum Consumption Models to Cognitive Radio Ontology for Automatic Inference, Analog Integrated Circuits and Signal Processing, 2017

L. Lechowicz, M.M. Kokar

Cognitive Radio: Interoperability Through Waveform Reconfiguration, Artech House, Norwood, MA, 2015

SELECTED RESEARCH PROJECTS

Converged Collaborative Elements for RF Task Operations Principal Investigator, Defense Advanced Research Projects Agency

MIRIAM LEESER



Professor, Electrical and Computer Engineering

PhD, Cambridge University, 1988 coe.northeastern.edu/people/leesermiriam

Scholarship focus: accelerators for compute intensive applications:

Field Programmable Gate Arrays (FPGAs) and graphics processing units (GPUs); applications including biocomputing, data privacy, machine learning, softwaredefined radio; uses and implementations of computer arithmetic

Honors and awards: Fulbright Scholar

SELECTED PUBLICATIONS

M. Blott, T.B. Preußer, N.J. Fraser, G. Gambardella, K. O'brien, Y. Umuroglu, M. Leeser, K. Vissers FINN-R: An End-to-End Deep-Learning Framework for Fast Exploration of Quantized Neural Networks, ACM Transactions on Reconfigurable Technology and Systems, 11(3), 2108, 16

B. Drozdenko, M. Zimmermann, T. Dao, K. Chowdhury, M. Leeser

Hardware-Software Codesign of Wireless Transceivers on Zynq Heterogeneous Systems, IEEE Transactions on Emerging Topics in Computing, 6(4), 2017, 566-578

J. Bhimani, N. Mi, M. Leeser, Z. Yang FiM: Performance Prediction for Parallel Computation in Iterative Data Processing Applications, In Cloud Computing (CLOUD), IEEE 10th International Conference, 2017, 359-366

M. Blott, T.B. Preußer, N. Fraser, G. Gambardella, K. O'Brien, Y. Umuroglu, M. Leeser

Scaling Neural Network Performance Through Customized Hardware Architectures on Reconfigurable Logic, In 2017 IEEE International Conference on Computer Design (ICCD), 2017, 419-422

X. Fang, S. Ioannidis, M. Leeser Secure Function Evaluation Using An FPGA Overlay Architecture, In Proceedings of the 2017 ACM/SIGDA International Symposium on Field-Programmable Gate Arrays, 2017, 257-266

SELECTED RESEARCH PROJECTS

Massively Scalable Secure Computation Infrastructure Using FPGAs

Co-Principal Investigator, National Science Foundation

Hardware/Software Implementations of Wireless Communications for 5G and Beyond Principal Investigator, Mathworks

BRAD LEHMAN



Professor, Electrical and Computer Engineering

PhD, Georgia Institute of Technology, 1992 coe.northeastern.edu/people/lehmanbradley

Scholarship focus: power electronics; dc-dc converters; pulse width modulation; motion control; electric motor drives; analog circuits; control theory; differential equations; time delays; nonlinear systems and control; industrial control

Honors and awards: IEEE Modeling and Control Technical Achievement Award of the IEEE Power Electronics Society; IEEE Standards Medallion; IEEE PELS Harry A. Owen, Jr. Distinguished Service Award, IEEE Award for Achievement in Power Electronics Standards, Princeton Review: The 300 Best Professors

SELECTED PUBLICATIONS

X. Zhang, Y. Li, S. Lu, H.F. Hamann, B. Hodge, B. Lehman, A Solar Time Based Analog Ensemble Method for Regional Solar Power Forecasting, IEEE Transactions on Sustainable Energy, 10(1), 2019, 268-279

M. Matam, V.R. Barry, B. Lehman

Performance Improvement of Dynamic PV Array Under Partial Shade Conditions Using M2 Algorithm, IET Renewable Power Generation, 13(8), 2019, 1239-1249

A.A. Stonier, B. Lehman

An Intelligent Based Fault Tolerant System for Solar Fed Cascaded Multilevel Inverters, IEEE Transactions on Energy Conversion, 33(3), 2018, 1047-1057

- D.T. Khanmiri, R. Ball, B. Lehman
- Degradation Effects on Energy Absorption Capability and Time to Failure of Low Voltage Metal Oxide Varistors, IEEE Transactions on Power Delivery, 32(5), 2017, 2272-2280

M. Forouzesh, Y.P. Siwakoti, S.A. Gorji, F. Blaabjerg, B. Lehman

Step-Up DC-DC Converters: A Comprehensive Review of Voltage-Boosting Techniques, Topologies, and Applications, IEEE Transactions on Power Electronics, 32(12), 2017, 9143-9178

SELECTED RESEARCH PROJECTS

Arc Fault Protection in Solar PV Systems

Principal Investigator, Mersen Corporation

S-STEM: Student-Pathways Opening World Engineering Resources

Principal Investigator, National Science Foundation

HANOCH LEV-ARI



Professor, Electrical and Computer Engineering

PhD, Stanford University, 1984 coe.northeastern.edu/people/lev-arihanoch

Scholarship focus: adaptive filtering; statistical signal processing; networked

dynamic state estimation; signal processing in electric energy systems

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

P. Ren, A. Abur, H. Lev-Ari

Tracking Transmission Line Parameters in Power Grids Observed by PMUs, 13th IEEE PES PowerTech Conference, Milano, Italy, 2019

- A. Ghanavati, H. Lev-Ari, A.M. Stankovic A Sub-Cycle Approach to Dynamic Phasors with Application to Dynamic Power Quality Metrics, IEEE Transactions on Power Delivery, 33(5), 2018, 2217-2225
- H. Lev-Ari, R.D. Hernandez, A.M. Stankovic, E.A. Marengo Adaptive Near-Optimal Compensation in Lossy Polyphase Power Systems, IEEE Transactions on Control Systems Technology, 26(2), 2018, 732-739
- B. Yan, H. Lev-Ari, A.M. Stankovic Networked State Estimation with Delayed and Irregularly-Spaced Time-Stamped Observations, IEEE Transactions on Control of Network Systems, 5(3), 2018, 888-900
- P. Ren, H. Lev-Ari, A. Abur Tracking Three Phase Untransposed Transmission Line Parameters Using Synchronized Measurements, IEEE Transactions on Power Systems, 33(4), 2018,

4155-4163

P. Hajiyani, H. Lev-Ari, A.M. Stankovic Mitigating Bad Data and Measurement Delay in Nonlinear Dynamic State Estimation, Proceedings of the IEEE International Symposium on Circuits and Systems (ISCAS), Montreal, 2016

P. Ren, H. Lev-Ari, A. Abur

Robust Continuous-Discrete Kalman Filter for Estimating Machine States with Model Uncertainties, 19th Power Systems Computation Conference (PSCC), Genoa, Italy, 2016

SELECTED RESEARCH PROJECTS

Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks (CURENT)

Co-Principal Investigator, National Science Foundation Advanced Cyber-Physical Models for Estimation and Control in Naval Power and Energy Systems Principal Investigator, Office of Naval Research

XUE LIN



Assistant Professor, Electrical and Computer Engineering

PhD, University of Southern California, 2016 coe.northeastern.edu/people/lin-xue

Scholarship focus: adversarial machine learning; deep learning acceleration and

hardware implementation; cyber-physical systems

SELECTED PUBLICATIONS

P. Zhao, S. Wang, C. Gongye, Y. Wang, Y. Fei, X. Lin Fault Sneaking Attack: A Stealthy Framework for Misleading Deep Neural Networks, Proceedings of the 56th Design Automation Conference (DAC), 2019

K. Xu, S. Liu, P. Zhao, P.-Y. Chen, H. Zhang, Q. Fan, D. Erdogmus, Y. Wang, X. Lin

Structured Adversarial Attack: Towards General Implementation and Better Interpretability, Proceedings of the International Conference on Learning Representations (ICLR), 2019

K. Xu, H. Chen, S. Liu, P.-Y. Chen, T.-W. Wen, M. Hong, X. Lin

Topology Attack and Defense for Graph Neural Networks: an Optimization Perspective, Proceedings of International Joint Conferences on Artificial Intelligence Organization (IJCAI), 2019

P. Zhao, S. Liu, Y. Wang, X. Lin

An ADMM-Based Universal Framework for Adversarial Attacks on Deep Neural Networks, Proceedings of ACM Multimedia (ACM MM), 2018

S. Wang, X. Wang, P. Zhao, D.Kaeli, P. Chin, X.Lin Defensive Dropout for Hardening Deep Neural Networks Under Adversarial Attacks, Proceedings of International Conference on Computer Aided Design (ICCAD), 2018

SELECTED RESEARCH PROJECTS

A Framework of Simultaneous Acceleration and Storage Reduction on Deep Neural Networks Using Structured Matrices

Principal Investigator, National Science Foundation

ADMM-NN: A Unified Software/Hardware Framework of DNN Computation and Storage Reduction Using ADMM Principal Investigator, National Science Foundation

Cultivating Robustness for Deep Learning

Principal Investigator, Air Force Research Laboratory

YONGMIN LIU



Associate Professor, joint faculty appointment in Mechanical and Industrial Engineering and Electrical and Computer Engineering

PhD, University of California, Berkeley, 2009 coe.northeastern.edu/people/liuyongmin

Scholarship focus: nano optics; nanoscale materials and engineering; nano devices; plasmonics; metamaterials; applied physics

Honors and awards: National Science Foundation CAREER Award, Office of Naval Research Young Investigator Award; SPIE Rising Researcher; 3M Non-Tenured Faculty Award, College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

W. Ma, F. Cheng, Y.M. Liu Deep-Learning-Enabled On-Demand Design of Chiral Metamaterials, ACS Nano, 12(6), 2018, 6326–6334

H. Su, X. Shen, G. Su, L. Li, J. Ding, F. Liu, P. Zhan, Y. M. Liu, Z. Wang

Efficient Generation of Microwave Plasmonic Vortices via a Single Deep-Subwavelength Meta-Particle, Laser & Photonics Reviews, 12, 2018, 1800010

Z.J. Wang, L.Q. Jing, K. Yao, Y.H. Yang, B. Zheng, C.M. Soukoulis, H.S. Chen, Y.M. Liu Origami-Based Reconfigurable Metamaterials for Tunable Chirality, Advanced Materials, 29, 2017, 1700412

K. Yao, Y.M. Liu Controlling Electric and Magnetic Resonances for Ultracompact Nanoantennas with Tunable Directionality, ACS Photonics, 3, 2016, 953-963

- Z.J. Wang, K. Yao, M. Chen, H. Chen, Y.M. Liu Manipulating Smith-Purcell Emission with Babinet Metasurfaces, Physical Review Letters, 117(15), 2016, 157401
- W.L. Gao, F.Z. Fang, Y.M. Liu, S. Zhang Chiral Surface Waves Supported by Biaxial Hyperbolic Metamaterials, Light: Science and Applications, 2015, e238

SELECTED RESEARCH PROJECTS

CAREER: Spin Plasmonics for Ultrafast All-Optical Manipulation of Magnetization in Hybrid Metal-Ferromagnet Structures

Principal Investigator, National Science Foundation

Multi-Functional Optical Meta-Systems Enabled by Deep-Learning-Aided Inverse Design

Principal Investigator, National Science Foundation

FABRIZIO LOMBARDI



ITC Endowed Professor, Electrical and Computer Engineering

PhD, University of London, 1982 coe.northeastern.edu/people/lombardifabrizio

Scholarship focus: fault-tolerant computing; VLSI CAD; testing,

configurable computing, distributed systems

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

H. Jiang, C. Shen, J. Han, F. Lombardi, P. Jonker Adaptive Filter Designs Using Stochastic Circuits, IEEE International Symposium on Very-Large-Scale Integration, Pittsburgh, 2016, 122-127

K. Namba, F. Lombardi

A Coding Scheme for Write Time Improvement of Phase Change Memory (PCM) Systems, IEEE Transactions on Multi-Scale Computing Systems, 2(4), 2016, 291-296

X. Cui, D.Wenwen, F. Lombardi, W. Liu

A Parallel Decimal Multiplier Using Hybrid Binary Coded Decimal (BCD) Codes, Proceedings of the IEEE International Symposium on Arithmetics, San Jose, 2016, 150-155

H.A.F. Almurib, F. Lombardi, T. Nandha Kumar Current-Based Testing, Modeling and Monitoring for Operational Deterioration of a Memristor-Based LUT, Journal of Electronic Testing Theory and Applications, 32(5), 2016, 587-599

W. Liu, L. Chen, W. Wang, F. Lombardi, M. O'Neill Design and Analysis of Inexact Floating-Point Adders, IEEE Transactions on Computers, 65(1), 2016, 308-314

S. Zare, S. Somu, C. Vittoria, F. Lombardi Field Sensors and Tunable Devices Using Magnetoelectric Hexaferrite on Silicon Substrates, IEEE Transactions on Electron Devices, 63(8), 2016, 3229-3235

K. Namba, F. Lombardi

High-Speed Parallel Decodable Single-Error Correcting (SEC) Codes, IEEE Transactions on Device and Material Reliability, 16(1), 2016, 30-37

L. Chen, J. Han, W. Liu, F. Lombardi

On the Design of Approximate Restoring Dividers for Error-Tolerant Applications, IEEE Transactions on Computers, 65(8), 2016, 2522-2533

EDWIN MARENGO



Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1997 coe.northeastern.edu/people/ marengo-fuentes-edwin

Scholarship focus: theoretical and applied electromagnetics, theoretical

and applied optics, scattering theory, wave inverse problems, noniterative inverse scattering, physics-based signal processing and imaging, change detection theory and applications, compressive sensing, electromagnetic information theory, analysis and design of optical and quantum holographic detectors

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

E.A. Marengo, E.S. Galagarza, R. Solimene Data-Driven Linearizing Approach in Inverse Scattering, Journal of the Optical Society of America A, 34(9), 2017, 1561-1576

E.A. Marengo

Quasi-Born Approximation Scattering and Inverse Scattering of Multiple Scattering Targets, IET Radar, Sonar and Navigation, 11, 2017, 1276-1284

J. Tu, E.A. Marengo

Generalized Likelihood Ratio Test Change Detection with Optical Theorem Constraint, Journal of the Optical Society of America A, 33, 2016, 2225-2236

E.A. Marengo, J. Tu

Generalized Optical Theorem in the Time Domain, Progress in Electromagnetics Research B, 65, 2016, 1-18

E.A. Marengo, J. Tu

Optical Theorem Detectors for Active Scatterers, Waves in Random and Complex Media, 25, 2015, 682-707

E.A. Marengo

Nonuniqueness of Optical Theorem Detectors, Journal of the Optical Society of America A, 32, 2015, 1936-1942

E.A. Marengo

Inverse Diffraction Theory and Computation of Minimum Source Regions of Far Fields, Mathematical Problems in Engineering, 513953, 2014, 1-18

E.A. Marengo, J. Tu

Optical Theorem for Transmission Lines, Progress in Electromagnetics Research B, 61, 2014, 253-268

E.A. Marengo

A New Theory of the Generalized Optical Theorem in Anisotropic Media, IEEE Transactions on Antennas and Propagation, 61, 2013, 2164-2179

JOSE MARTINEZ LORENZO



Associate Professor, Mechanical and Industrial Engineering; jointly appointed, Electrical and Computer Engineering

PhD, University of Vigo, 2005 coe.northeastern.edu/people/martinezlorenzo-jose-angel

Scholarship focus: devices, circuits and sensing; antenna analysis, modeling, design, and optimization; subsurface scattering analysis; computational methods of electromagnetics; novel radar system specification and design; explosives detection

SELECTED PUBLICATIONS

- A. Molaei, A. Bisulco, L. Tirado, A. Zhu, D. Cachay, A.G. Dagheyan, and J.A. Martinez-Lorenzo 3D Printed E-Band Compressive Horn Antenna for High-Sensing-Capacity Imaging Applications, IEEE Antennas and Wireless Propagation Letters, 2018, 1
- J.L. Crespo-Vázquez, C.J.C. Gonzalez, E. Diaz-Dorado, J.A. Martinez-Lorenzo, M. Noor-E-Alam

Evaluation of a Data Driven Stochastic Approach to Optimize the Participation of a Wind and Storage Power Plant in Day-Ahead and Reserve Markets, Energy 156(8), 2018, 278–291

A.G. Dagheyan, C. Liu, A. Molaei, J.H. Juesas, J. A. Martinez-Lorenzo

Holey-Cavity-Based Compressive Sensing for Ultrasound Imaging, Sensors, 18(6), 2018, 1674

J.H. Juesas, J.E. Thatcher, Y. Lu, J.J. Squiers, D. King W. Fan, J.M. DiMaio, J.A. Martinez-Lorenzo

Burn-Injured Tissue Detection for Debridement Surgery through Non-Invasive Optical Imaging Techniques, Biomed Opt Express, 9(4), 2018, 1809–1826

Y. Rodriguez-Vaqueiro, P. Paayam, R. Sipahi, J.A. Martinez-Lorenzo

Development of a Combined Time Frequency Technique for Accurate Extraction of pNN50 Metric from Noisy Heart Rate Measurements, International Journal of Intelligent Robotics and Applications, 2, 2018, 193–208

SELECTED RESEARCH PROJECTS

CAREER: 4D mm-Wave Compressive Sensing and Imaging at One Thousand Volumetric Frames per Second

Principal Investigator, National Science Foundation Improved Millimeter Wave Radar AIT Characterization of Concealed Low-Contrast Body- Borne Threats

Co-Principal Investigator, Department of Homeland Security

NICOL MCGRUER



Professor, Electrical and Computer Engineering; affiliated faculty: Mechanical and Industrial Engineering, Bioengineering

PhD, Michigan State University, 1983 coe.northeastern.edu/people/ mcgruer-nicol

Scholarship focus: MEMS,

NEMS, RF MEMS; nanotechnology; micro/ nanofabrication; microsystems; microrelay; nanoswitch; microspectrometer; microfluidics; organic FETs, organic solar cells

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering, Joel and Spira Excellence in Teaching Award

SELECTED PUBLICATIONS

W.Z. Zhu, T. Wu, G. Chen, C. Cassella, M. Assylbekova, M. Rinaldi, N. McGruer

Design and Fabrication of an Electrostatic AIN RF MEMS Switch for Near-Zero Power RF Wake-Up Receivers, IEEE Sensors Journal, 18(24), 2018, 9902–9909

Z. Qian, S. Kang, V. Rajaram, C. Cassella, N.E. McGruer, M. Rinaldi

Zero-Power Infrared Digitizers Based on Plasmonically Enhanced Micromechanical Photoswitches, Nature Nanotechnology 12, 2017, 969–973

S.D. Berger, N.E. McGruer, G.G. Adams Simulation of Dielectrophoretic Assembly of Carbon Nanotubes Using 3D Finite Element Analysis, Nanotechnology, 26(15), 2015, e155602

A. Basu, R.P. Hennessy, G.G. Adams, N.E. McGruer Hot Switching Damage Mechanisms in MEMS Contacts– Evidence and Understanding, Journal of Micromechanics and Microengineering, 24, 2014, e105004

Y.-C. Wu, N. McGruer, G.G. Adams Adhesive Slip Process Between a Carbon Nanotube and a Substrate, Journal of Physics D: Applied Physics, 46, 2013, e175305

R.P. Hennessy, A. Basu, G.G. Adams, N. McGruer Hot-Switched Lifetime and Damage Characteristics of MEMS Switch Contacts, Journal of Micromechanics and Microengineering, 23(5), 2013, e055003

SELECTED RESEARCH PROJECTS

PLASMID (Plasmonic Microelectromechanical Infrared Digitizer), Zero-Power Sensor Co-Principal Investigator, Defense Advanced Research Projects Agency

Zero Power Sensors (ZePS), RF Wake-up

Co-Principal Investigator, Defense Advanced Research Projects Agency

WALEED MELEIS



Interim Associate Dean of Graduate Education, Associate Professor and Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Michigan, 1996 coe.northeastern.edu/people/meleiswaleed

Scholarship focus: combinatorial optimization; algorithm design and analysis; scheduling; large-scale machine learning; parallel computing

Honors and awards: COE Outstanding Faculty Service Award, COE Fostering Engineering Innovation in Education Award; Black Engineering Student Society Professor Appreciation Award; Invited to represent Northeastern at the National Academy of Engineering's Frontiers of Engineering Education Symposium; College of Engineering Outstanding Teacher Award; Martin W. Essigmann Outstanding Teaching Award, College of Engineering; Eta Kappa Nu Professor of the Year Award; Center for Innovative Course Design Teaching Award, EdTech

SELECTED PUBLICATIONS

W. Li, W. Meleis

Adaptive Adjacency Kanerva Coding for Memory-Constrained Reinforcement Learning, In International Conference on Machine Learning and Data Mining in Pattern Recognition (MLDM), Springer, New York, 2018

D. Levac, H. Dumas, W. Meleis

Development and Preliminary Usability Evaluation of a Tablet-Based Interactive Movement Tool for Pediatric Rehabilitation, JMIR Rehabilitation Assistive Technologies 25(2), 2018, e1030

W. Li, F. Zhou, K. Chowdhury, W. Meleis

QTCP: Adaptive Congestion Control with Reinforcement Learning, IEEE Transactions on Network Science and Engineering, 2018, 1-1

W. Li, F. Zhou, W. Meleis, K. Chowdhury

Dynamic Generalization Kanerva Coding in Reinforcement Learning for TCP Congestion Control Design, Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems, Sao Paolo, Brazil, 2017

J. Radford, A. Pilny, A. Reichelmann, B. Keegan, B. Welles,

J. Hoye, K. Ognyanova, W. Meleis, D. Lazer Volunteer Science: An Online Laboratory for Experiments in Social Psychology, Social Psychology Quarterly, 79(4), 2016

TOMMASO MELODIA



William Lincoln Smith Professor, Electrical and Computer Engineering; Director, Institute for the Wireless Internet of Things

PhD, Georgia Institute of Technology, 2007 coe.northeastern.edu/people/ melodia-tommaso

Scholarship focus: modeling, optimization, and experimental evaluation of wireless networked systems; networked implantable medical systems; multimedia sensor networks; secure tactical cognitive radio networks; underwater networks; mobile cloud computing

Honors and awards: National Science Foundation CAREER Award, IEEE Fellow, IEEE Communications Society Distinguished Lecturer, Soren Buus Outstanding Research Award

SELECTED PUBLICATIONS

- L. Zhang, F. Restuccia, T. Melodia, S. Pudlewski Jam Sessions: Analysis and Experimental Evaluation of Advanced Jamming Attacks in MIMO Networks, ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc), Catania, Italy, 2019
- S. D'Oro, F. Restuccia, A. Talamonti, T. Melodia The Slice Is Served: Enforcing Radio Access Network Slicing in Virtualized 5G Systems, IEEE Conference on Computer Communications (INFOCOM) Paris, France, 2019
- F. Restuccia, S. D'Oro, A. Al-Shawabka, M. Belgiovine, L. Angioloni, S. Ioannidis, K. Chowdhury, T. Melodia DeepRadioID: Real-Time Channel-Resilient Optimization of Deep Learning-based Radio Fingerprinting Algorithms, ACM International Symposium on Mobile Ad Hoc Networking and Computing (MobiHoc) Catania, Italy, 2019
- F. Restuccia, T. Melodia

Big Data Goes Small: Real-Time Spectrum-Driven Embedded Wireless Networking Through Deep Learning in the RF Loop, IEEE Conference on Computer Communications (INFOCOM) Paris, France, 2019

SELECTED RESEARCH PROJECTS

CAREER: Towards Ultrasonic Networking for Implantable Biomedical Devices

Principal Investigator, National Science Foundation

MRI: SEANet: Development of a Software-Defined Networking Testbed for the Internet of Underwater Things Principal Investigator, National Science Foundation

NINGFANG MI



Associate Professor, Electrical and Computer Engineering

PhD, College of William and Mary, 2009 coe.northeastern.edu/people/miningfang

Scholarship focus: capacity planning; NVMe Flash Memory Devices,

MapReduce/Hadoop scheduling; cloud computing; resource management; performance evaluation; workload characterization; simulation

Honors and awards: National Science Foundation CAREER Award; IBM Faculty Award; Air Force Office of Scientific Research Young Investigator Award

SELECTED PUBLICATIONS

- J. Bhimani, N. Mi, M. Leeser, Z. Yang New Performance Modeling Methods for Parallel Data Processing Applications, ACM Transactions on Modeling and Computer Simulation (TOMACS), 2019
- Y. Yao, H. Gao, J. Wang, B. Sheng, N. Mi New Scheduling Algorithms for Improving Performance and Resource Utilization in Hadoop YARN Clusters, IEEE Transactions on Cloud Computing (TCC), 2019
- J. Bhimani, Z. Yang, N. Mi, J.Yang, Q. Xu, M. Awasthi, R. Pandurangan, V. Balakrishnan

Docker Container Scheduler for I/O Intensive Applications running on NVMe SSDs, IEEE Transactions on Multi-Scale Computing Systems (TMSCS), 4(3), 2018, 313-326

J. Bhimani, N. Mi, Z. Yang, J. Yang, R. Pandurangan, C. Choi, V. Balakrishnan

FIOS: Feature Based I/O Stream Identification for Improving Endurance of Multi-Stream SSDs, IEEE International Conference on Cloud Computing (CLOUD'18), 2018

Z. Yang, M. Hoseinzadeh, P. Wong, J. Artoux, C. Mayers, D.T. Evans, R.T. Bolt, J. Bhimani, N. Mi, S. Swanson H-NVMe: A Hybrid Framework of NVMe-Based Storage System in Cloud Computing Environment, 36th IEEE International Performance Computing and Communications Conference (IPCCC'17), San Diego, CA, 2017

SELECTED RESEARCH PROJECTS

CAREER: Capacity Planning Methodologies for Large Clusters with Heterogeneous Architectures and Diverse Applications

Principal Investigator, National Science Foundation

HOSSEIN MOSALLAEI



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of California, Los Angeles, 2001 coe.northeastern.edu/people/ mosallaei-hossein

Scholarship focus: electromagnetics

and optics; quantum systems; nanoscale materials and metamaterials, nanoantennas; THz-IR-Visible Devices; multiscale computation and mathematical-numerical models

SELECTED PUBLICATIONS

A. Forouzmand, M.M. Salary, S. Inampudi, H. Mosallaei A Tunable Multigate Indium-Tin-Oxide-Assisted All-Dielectric Metasurface, Advanced Optical Materials, 6(7), 2018, 1701275

A. Forouzmand, H. Mosallaei

Dynamic Beam Control via Mie-Resonance Based Phase-Change Metasurface: A Theoretical Investigation, Optics Express, 26(14) 2018

S. Inampudi, J. Cheng, M.M. Salary, H. Mosallaei Unidirectional Thermal Radiation from SiC Metasurface, Journal of the Optical Society of America B, 35(1), 2018

- M.M. Salary, S. Inampudi, H. Mosallaei Characterization of Optomechanical Modes in Multilayer Stack of Graphene sheets, Journal of Materials Research, 2017
- S. Valleau, S.K. Saikin, D. Ansari O.B., M. Rostami,
- H. Mosallaei, A. Aspuru-Guzik Electromagnetic Study of the Chlorosome Antenna Complex of Chlorobium-Tepidum, ACS Nano, 2014
- J. Cheng, D. Ansari, H. Mosallaei Wave Manipulation with Designer Dielectric Metasurfaces, Optics Letters, 39(21), 2014, 6285-6288

SELECTED RESEARCH PROJECTS

Nanoantennas for Engineering Waves on the Surface Principal Investigator, Air Force Office of Scientific Research

MARVIN ONABAJO



Associate Professor, Electrical and Computer Engineering

PhD, Texas A&M University, 2011 coe.northeastern.edu/people/onabajomarvin

Scholarship focus: design of analog, radio frequency, and mixed-signal

integrated circuits; built-in test and calibration techniques for systems-on-a-chip; on-chip temperature sensors for thermal monitoring and built-in testing

Honors and awards: National Science Foundation CAREER Award; Martin Essigman Outstanding Teaching Award, College of Engineering; ARO Young Investigator Program Award

SELECTED PUBLICATIONS

M.A.A. Ibrahim, M. Onabajo

Sinusoidal Signal Generation through Successive Integration, Proceedings of IEEE International Symposium on Circuits and Systems (ISCAS), 2019

C.H. Chang, M. Onabajo

Analysis and Demonstration of an IIP3 Improvement Technique for Low-Power RF Low-Noise Amplifiers, IEEE Trans. on Circuits and Systems I: Regular Papers, 65(3), 2018, 859-869

G. Jha, M.A.A. Ibrahim, M. Onabajo

A Low-Power Complex Bandpass Gm-C Filter with Dynamic Range Expansion Through Adaptive Biasing, Proc. IEEE Intl. Symp. on Circuits and Systems (ISCAS), 2018

SELECTED RESEARCH PROJECTS

An On-Chip Thermal Sensing Method to Detect Malicious Integrated Circuits

Principal Investigator, Army Research Office

CAREER: Low-Power Transceiver Design Methods for Wireless Medicalx Monitoring

Principal Investigator, National Science Foundation

Novel Implantable Smart Magnetoelectric NanoRFIDs for Large-Scale Neural Magnetic Recording and Modulation Co-Principal Investigator, National Institutes of Health

Ultra-Low Power Analog Computing and Dry Skin-Electrode Contact Interface Design Techniques for Systems-On-A-Chip with EEG Sensing and Feature Extraction

Co-Principal Investigator, National Science Foundation

SARAH OSTADABBAS



Assistant Professor, Electrical and Computer Engineering

PhD, University of Texas at Dallas, 2014 coe.northeastern.edu/people/ ostadabbas-sarah

Scholarship focus: machine learning/ pattern recognition; computer vision, affective computing, human-machine interaction

SELECTED PUBLICATIONS

S. Liu, Y. Yin, S. Ostadabbas

In-Bed Pose Estimation: Deep Learning with Shallow Dataset, Journal of Translational Engineering in Health and Medicine (JTEHM), 7(1), 2019, 1-12

C. Chou, X. Jin, A. Mueller, S. Ostadabbas

Multimodal Data Fusion–Moving from Domain-Specific Algorithms to Trans-Domain Understanding for Accelerated Solution Development, Multimodal Data Fusion (MMDF) Special Issue, IEEE Sensors Letters, 3(1), 2019, 1-4

B. Rezaei, S. Ostadabbas

Moving Object Detection through Robust Matrix Completion Augmented with Objectness, IEEE Journal of Selected Topics in Signal Processing (J-STSP), 2018

S. Liu, S. Ostadabbas

Inner Space Preserving Generative Pose Machine, European Conference on Computer Vision, 2018, Munich, Germany

Y. Yin, M. Nabian, M. Fan, C. Chou, M. Gendron, S. Ostadabbas

Facial Expression and Peripheral Physiology Fusion to Decode Individualized Affective Experience, Affective Computing Workshop of the 27th International Joint Conference on Artificial Intelligence (IJCAI-2018)

- A. Farnoosh, M. Nabian, P. Closas, S. Ostadabbas First-Person Indoor Navigation via Vision-Inertial Data Fusion, IEEE/ION PLANS Conference, 2018, 1213-1222
- S. Liu, S. Ostadabbas

A Vision-Based System for In-Bed Posture Tracking, Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (ICCV/ACVR'17) 1373-1382

SELECTED RESEARCH PROJECTS

CRII: SCH: Semi-Supervised Physics-Based Generative Model for Data Augmentation and Cross-Modality Data Reconstruction

Principal Investigator, National Science Foundation

NCS-FO: Leveraging Deep Probabilistic Models to Understand the Neural Bases of Subjective Experience Co-Principal Investigator, National Science Foundation-Neural and Cognitive Systems

TASKIN PADIR



Associate Professor, Electrical and Computer Engineering; affiliated faculty Mechanical and Industrial Engineering

PhD, Purdue University, 2004 coe.northeastern.edu/people/padirtaskin

Scholarship focus: humanoid robots dexterous manipulation, model-based

robot design, human- supervised robot autonomy, medical cyber-physical systems

Honors and awards: Kalenian Award for Entrepreneurial Spirit, HEART: Humans Empowered with Assistive Robot Technologies; COE Fostering Engineering Innovation in Education Award

SELECTED PUBLICATIONS

A.O. Onol, P. Long, T. Padir

Contact-Implicit Trajectory Optimization Based on a Variable Smooth Contact Model and Successive Convexification, IEEE International Conference on Robotics and Automation (ICRA), 2019

M. Zhong, J. Wu, Y. Yan, J. Hajjar, T. Padir

Towards Automated Post-Disaster Damage Assessment of Critical Infrastructure with Small Unmanned Aircraft Systems, IEEE International Symposium onTechnologies for Homeland Security, Woburn, October 23-24, 2018

X. Long, M. Wonsick, V. Dimitrov, T. Padır

Anytime Multi-Task Motion Planning for Humanoid Robots, In Intelligent Robots and Systems (IROS), IEEE/ RSJ International Conference, 2017, 4452-4459

X. Long, P. Long, T. Padir

Compositional Autonomy for Humanoid Robots with Risk-Aware Decision-Making, Humanoid Robotics (Humanoids), IEEE-RAS 17th International Conference, 2017, 553-560

SELECTED RESEARCH PROJECTS

Accessible Testing on Humanoid-Robot-R5 and Evaluation of NASA Administered (ATHENA) Space Robotics Challenge

Principal Investigator, National Aeronautics and Space Administration

Collaborative Research: Cooperative Control of Humanoid Robots for Remote Operations in Nuclear Environments Principal Investigator, Department of Energy

Collaborative Robotics to Foster Innovation in Seafood Handling

Principal Investigator, Advanced Robotics for Manufacturing (DOD)

ALIREZA RAMEZANI



Assistant Professor, Electrical and Computer Engineering

PhD, University of Michigan, 2014 coe.northeastern.edu/people/ ramezani-alireza

Scholarship focus: analysis and feedback control of nonlinear systems;

control of bipedal and aerial robot locomotion; bioinspired robotics

SELECTED PUBLICATIONS

- J. E. Hoff, A. Ramezani, S.-J. Chung, S. Hutchinson Optimizing the Structure and Movement of a Robotic Bat with Biological Kinematic Synergies, International Journal of Robotics Research (IJRR), 37(10), 2018, 1233-1252
- A. Ramezani, S.-J. Chung, S. Hutchinson A Biomimetic Robotic Platform to Study Flight Specializations of Bats, Science (Robotics-AAAS), 2(3), 2017, eaal2505
- A. Ramezani, X. Shi, S.-J. Chung, S. Hutchinson Bat Bot (B2), A Biologically Inspired Flying Machine, Proc. IEEE International Conference on Robotics and Automation (ICRA), Stockholm, Sweden, 2016, 3219-3226
- A. Ramezani, X. Shi, S.-J. Chung, S. Hutchinson Nonlinear Flight Controller Synthesis of a Bat-Inspired Micro Aerial Vehicle, Proc. AIAA Guidance, Navigation, and Control Conference, San Diego, CA, 2016, AIAA 2016-1376
- J. E. Hoff, A. Ramezani, S.-J. Chung, S. Hutchinson Synergistic Design of a Bio-Inspire Micro Aerial Vehicle with Articulated Wings, Robotics Science and Systems Conference (RSS), University of Michigan, Ann Arbor, MI, 2016

CAREY RAPPAPORT



COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering; Associate Director, CenSSIS

PhD, Massachusetts Institute of Technology, 1987 coe.northeastern.edu/people/ rappaport-carey

Scholarship focus: antennas, electromagnetic computation, subsurface sensing and imaging, explosives detection, security system conceptualization and design. Bioelectromagnetics, microwave tissue imaging, electromagnetic breast cancer detection and treatment, cardiac ablation therapy, microwave assisted balloon angioplasty, catheter-based sensing

Honors and awards: Fellow and Distinguished Lecturer, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

M. Tajdini, B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, A. Morgenthaler, C. Rappaport

Real-Time Modeling of Forward-Looking Synthetic Aperture Ground Penetrating Radar Scattering From Rough Terrain, IEEE Transactions on Geoscience and Remote Sensing, 57(5), 2019, 2754-2765

Y. Fuse, B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, C. Rappaport

Model-Based Clutter Reduction Method for Forward Looking Ground Penetrating Radar Imaging Ground Penetrating Radar, 1(2), 2018, 96-112

B. Gonzalez-Valdes, Y. Alvarez, Y. Rodriguez-Vaqueiro, A. Arboleya-Arboleya, A. Garcia-Pino, C. Rappaport,

F. Las-Hera, J.A. Martinez-Lorenzo

Millimeter Wave Imaging Architecture for the Onthe-Move Whole Body Imaging, IEEE Transactions on Antennas and Propagation, 64(6), 2016, 2328-2338

C. Rappaport, B. Gonzalez-Valdes

Multistatic Nearfield Imaging Radar for Portal Security Systems Using a High Gain Toroidal Reflector Antenna, European Conference on Antennas and Propagation (EuCAP), Lisbon, Portugal, 2015, *best paper award

SELECTED RESEARCH PROJECTS

Awareness and Localization of Explosive-Related Threats (ALERT)

Co-Principal Investigator, Department of Homeland Security

Improved Millimeter Wave Radar AIT Characterization of Concealed Low-Contrast Body-Bourne Threats

Principal Investigator, Department of Homeland Security

PURNIMA RATILAL-MAKRIS



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Massachusetts Institute of Technology, 2002 coe.northeastern.edu/people/ratilalmakris-purnima

Scholarship focus: remote sensing; underwater acoustics; acoustical oceanography; bioacoustics; ultrasound imaging; nonlinear scattering; wave propagation in random media; signal, image and array processing; statistical inference theory

Honors and awards: Fellow, Acoustical Society of America; Presidential Early Career Award for Scientists and Engineers; Office of Naval Research Young Investigator Award

SELECTED PUBLICATIONS

C. Zhu, H. Garcia, A. Kaplan, M. Schinault, N.O. Handegard, O.R. Godø, W. Huang, P. Ratilal

Detection, Localization and Classification of Multiple Mechanized Ocean Vessels over Continental-Shelf Scale Regions with Passive Ocean Acoustic Waveguide Remote Sensing, Remote Sensing, 10(11), 2018, 1699

D. Wang, P. Ratilal

Angular Resolution Enhancement Provided by Nonuniformly-Spaced Linear Hydrophone Arrays in Ocean Acoustic Waveguide Remote Sensing, **Remote Sensing**, 9(10), 2017, 1036, 1-16

D. Wang, H.Garcia, W. Huang, D.D. Tran, A.D. Jain, D.H. Yi, Z. Gong, J.M. Jech, O.R. Godoe, N.C. Makris, P. Ratilal

Vast Assembly of Vocal Marine Mammals from Diverse Species on Fish Spawning Ground, Nature, 531, 2016, 366-370

D. Tran, W. Huang, A. Bohn, D. Wang, N. Makris, P. Ratilal, et al. Using a Coherent Hydrophone Array for Observing Sperm Whale Range, Classification, and Shallow-Water Dive Profiles, The Journal of the Acoustical Society of America, 135(6), 2014, 3352-3363

Z. Gong, D. Tran, P. Ratilal

Comparing Passive Source Localization and Tracking Approaches With a Towed Horizontal Receiver Array in an Ocean Waveguide, The Journal of the Acoustical Society of America, 134, 2013, 3705-3720

M. Andrews, Z. Gong, P. Ratilal

Effects of Multiple Scattering, Attenuation and Dispersion in Waveguide Sensing of Fish, Journal of the Acoustical Society of America, 130, 2011, 1253-1271

MATTEO RINALDI



Associate Professor, Electrical and Computer Engineering

PhD, University of Pennsylvania, 2010 coe.northeastern.edu/people/rinaldimatteo

Scholarship focus: understanding and exploiting the fundamental properties of micro/nanomechanical structures

and advanced nanomaterials to engineer new classes of micro and nanoelectromechanical systems (M/NEMS) with unique and enabling features applied to the areas of chemical, physical and biological sensing and low power reconfigurable radio communication systems

Honors and awards: IEEE Sensors Council Early Career Award; National Science Foundation CAREER Award; Defense Advanced Research Projects Agency Young Faculty Award

SELECTED PUBLICATIONS

C. Cassella, Y. Hui, Z. Qian, G. Hummel, M. Rinaldi Aluminum Nitride Cross-Sectional Lamé Mode Resonators, IEEE/ASME Journal of Microelectromechanical Systems, 25(2), 2016, 275-285

C. Cassella, G. Chen, Z. Qian, G. Hummel, M. Rinaldi Cross-sectional Lamé Mode Ladder Filters for UHF Wideband Applications, IEEE Electron Device Letters, 37, 2016, 681-683

Y. Hui, J. S. Gomez-Diaz, Z. Qian, A. Alu', M. Rinaldi Plasmonic Piezoelectric Nanomechanical Resonator for Spectrally Selective Infrared Sensing, Nature Communications, 7, 2016, 11249

Z. Qian, F. Liu, Y. Hui, S. Kar, M. Rinaldi Graphene as a Massless Electrode for Ultra-High-Frequency Piezoelectric Nano Electro Mechanical Systems, Nano Letters, 15(7), 2015, 4599-4604

SELECTED RESEARCH PROJECTS

CAREER: Nano Electro Mechanical Resonant Sensing Platform for Chip Scale, High Resolution and Ultra-Fast Terahertz Spectroscopy and Imaging

Principal Investigator, National Science Foundation

Intrinsically Switchable and Programmable MEMS Filter Array

Principal Investigator, Defense Advanced Research Projects Agency

Microelectromechanical Resonant Circulator (MIRC) Principal Investigator, DARPA MTO SPAR program

Plasmonic Microelectromechanical Infrared Digitizer (PLASMID) Principal Investigator, DARPA MTO N-Zero program

Zero Power Sensors (ZePS)

Principal Investigator, DARPA MTO N-Zero program

WILLIAM ROBERTSON



Assistant Professor, Computer & Information Science; jointly appointed, Electrical and Computer Engineering

PhD, University of California, Santa Barbara, 2009 coe.northeastern.edu/people/ robertson-wil

Scholarship focus: trustworthy computing architectures; web security; statistical machine learning for anomaly detection; malware analysis using adversarial program analysis; reverse engineering; intrusion detection

SELECTED PUBLICATIONS

- A. Ozcan, C. Mulliner, W. Robertson, E. Kirda, et al. BabelCrypt: The Universal Encryption Layer for Mobile Messaging Applications, Proceedings of the International Conference on Financial Cryptography and Data Security (FC), Isla Verde, PR, 2015, 1-15
- M. Weissbacher, W. Robertson, E. Kirda, C. Kruegel, G. Vigna

ZigZag: Automatically Hardening Web Applications Against Client-Side Validation Vulnerabilities, Proceedings of the USENIX Security Symposium, Washington DC, 2015, 737-752

C. Mulliner, W. Robertson, E. Kirda

Hidden GEMs: Automated Discovery of Access Control Vulnerabilities in Graphical User Interfaces, Proceedings of the IEEE Symposium on Security and Privacy (Oakland), San Jose, CA, 2014, 1-14

M. Weissbacher, T. Lauinger, W. Robertson

Why is CSP Failing? Trends and Challenges in CSP Adoption, Proceedings of the International Symposium on Research in Attacks, Intrusions, and Defenses (RAID), Gothenburg, 2014, 1-22

SELECTED RESEARCH PROJECTS

Automated Inference of High-Level Program Structure Principal Investigator, Office of Naval Research

Continuum: Finding Space and Time Vulnerabilities in Java Programs

Principal Investigator, Defense Advanced Research Projects Agency

DarkDroid: Exposing the Dark Side of Android Marketplaces

Co-Principal Investigator, Defense Advanced Research Projects Agency

Firmalice: Modeling and Identifying Malice in Firmware Co-Principal Investigator, Defense Advanced Research Projects Agency

Multi-Disciplinary Preparation of Next Generation Information Assurance Practitioners

Co-Principal Investigator, National Science Foundation

MASOUD SALEHI



Associate Professor, Electrical and Computer Engineering

PhD, Stanford University, 1979 coe.northeastern.edu/people/salehimasoud

Scholarship focus: error correcting codes; information theory; digital

communications

SELECTED PUBLICATIONS

K. Firouzbakht, G. Noubir, M. Salehi Multi-Carrier Jamming Mitigation: A Proactive Game

Theoretic Approach, in Proactive and Dynamic Network Defense, Springer Verlag, 2019, 249-264

- M. Sadeghzadeh, M. Maleki, M. Salehi Large-Scale Analysis of Regularized Block Diagonalization Precoding for Physical Layer Security of Multi-User MIMO Wireless Networks, IEEE Transactions on Vehicular Technology, 68(6), 2019, 5820-5834
- M. Sadeghzadeh, M. Maleki, M. Salehi, H.R. Bahrami Large-Scale Analysis of Physical-Layer Security in Multi-User Wireless Networks, IEEE Transactions on Communications, 66(12), 2018, 1-1
- M. Sadeghzadeh, M. Maleki, M. Salehi, H. Bahrami Large Scale Analysis of Physical Layer Security in Multi-User Wireless Networks, Proceedings of the IEEE International Conference on Communications (ICC), Paris, France, 2017
- M. Sadeghzadeh, M. Maleki, M. Salehi Large Scale Analysis of Regularized Block Diagonalization Precodering for Physical Layer Security in Multi-User Wireless Networks, IEEE Globecom Conference, Singapore, 2017

K. Firouzbakht, G. Noubir, M. Salehi Linearly Constrained Bimatrix Games in Wireless Communications, IEEE Transactions on Communications, 64, 2016, 429-440

K.-L. Huang, V.C. Gaudet, M. Salehi A Hybrid ARQ Scheme Using LDPC Codes with Stochastic

Decoding, Proceedings of the 49th Annual Conference on Information Sciences and Systems, 2015, 1-4

N. Yang, M. Salehi

A Family of Orthogonal Full Rate Differential Space Time Block Code Systems, Proceedings of the IEEE Military Communications Conference (MILCOM), Baltimore, MD, 2014, 569-574

J.G. Proakis, M. Salehi

Fundamentals of Communication Systems, Second Edition Pearson, 2014

GUNAR SCHIRNER



Associate Professor, Electrical and Computer Engineering

PhD, University of California, Irvine, 2008 coe.northeastern.edu/people/schirnergunar

Scholarship focus: embedded

computer systems; novel architectures for embedded vision; cyber-physical systems; system-level design and methodologies; hardware/software co-design

SELECTED PUBLICATIONS

- N. Teimouri, H. Tabkhi, G. Schirner Alleviating Scalability Limitation of Accelerator-based Platforms, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD), June 2018
- J. Zhang, H. Tabkhi, G. Schirner DS-DSE: Domain-Specific Design Space Exploration for Streaming Applications, Design Automation and Test in Europe (DATE), Dresden, Germany, March 2018
- N. Teimouri, H. Tabkhi, G. Schirner Improving Scalability of CMPs with Dense ACCs Coverage, Design Automation and Test in Europe (DATE), Dresden, Germany, March 2016
- N. Teimouri, H. Tabkhi, G. Schirner Revisiting Accelerator-Rich CMPs: Challenges and Solutions, Proceedings of the 52nd Annual Design Automation Conference (DAC), San Francisco, CA, 84, 2015

C. Zhang, H. Tabkhi, G. Schirner Studying Inter-Warp Divergence Aware Execution on GPUs, IEEE Computer Architecture Letters, 15(2), 2015, 117-120

H. Tabkhi, G. Schirner

Application-Guided Power Gating Reducing Register File Static Power, IEEE Transactions on Very Large Scale Integration (TVLSI), 22(12), 2014, 2513-2526

J. Zhang, G. Schirner

Automatic Specification Granularity Tuning for Design Space Exploration, Design Automation and Test in Europe (DATE), Dresden, Germany, 2014, 1-6

SELECTED RESEARCH PROJECTS

Collaborative Research: Nested Control of Assistive Robots through Human Intent Inference

Co-Principal Investigator, National Science Foundation

Domain-Specific Computing enabling Real-Time Al Inference on the Edge for Expeditionary Cyber Missions Principal Investigator, Office of Naval Research

BAHRAM SHAFAI



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, George Washington University, 1985 coe.northeastern.edu/people/shafaibahram

Scholarship focus: control systems; digital signal processing; robust and optimal control

Honors and awards: Associate Editor, Editorial Board and Program Chair of ISIAC-WAC; Senior Life Member, Institute of Electrical and Electronics Engineers, Lifetime Achievement Award from World Automation Congress, 2018; Certificate of Appreciation for Technical Seminar Institute of Electrical and Electronics Engineers, Young Professionals

SELECTED PUBLICATIONS

G. Eftekhari Yazdi, H. Nezamfar, M. Moghadamfalahi, M. Akcakaya, B. Shafai, D. Erdogmus An Adaptive Proportional BCI-Controller for Linear Dynamic Systems, Proceedings of ISIAC-WAC, 2018

A. Oghbaee, B. Shafai, S. Nazari

Complete Characterization of Disturbance Estimation and Fault Detection for Positive Systems, IET Journal of Control Theory and Applications, 12, 2018, 883-891

A. Oghbaee, B. Shafai

Eigenvalue Assignment for Positive Discrete-Time Linear Systems, Proceedings of ISIAC-WAC, 2018

S. Nazari, B. Shafai

Positive Unknown Input Observer for Fault Detection of Positive Distributed Systems, Proceedings of 26th Mediterranean Conference on Control and Automation (MED) Zadar, Croatia, 2018, 715-720

S. Nazari, B. Shafai, A. Oghbaee

Design of Attack Tolerant Detection Topologies for Distributed Systems, Proceedings of 2017 IEEE 56th Annual Conference on Decision and Control (CDC), Melbourne, Australia, 2017, 5385-5390

B. Shafai, C. Li

Positive Stabilization of Singular Systems by Proportional Derivative State Feedback, Proceedings of IEEE Conference on Control Technology and Applications (CCTA), Mauna Lani, HI, 2017, 1140-1146

A. Oghbaee, B. Shafai, M. Sznaier

Symmetric Positive Stabilization of Linear Time-Invariant Systems, IEEE 30th Canadian Conference on Electrical and Computer Engineering (CCECE), Windsor, CA, 2017, 1–7

AATMESH SHRIVASTAVA



Assistant Professor, Electrical and Computer Engineering

PhD, University of Virginia, 2014 coe.northeastern.edu/people/ shrivastava-aatmesh

Scholarship focus: ultra-low Power circuits and systems, analog computing,

precision circuits, hardware security

SELECTED PUBLICATIONS

N. Mirchandani, A. Shrivastava

CMOS Based Ultra-Low Power High-Precision Analog Vector Matrix Multiplication Circuit with ±0.1% Error for Vision Application, Midwest Symposium on Circuits and Systems (MWSCAS)-Invited, 2019

N. Mirchandani, A. Shrivastava

High Stability Gain Structure and Filter Realization with less than 50 ppm/°C Temperature Variation with Ultra-low Power Consumption using Switched-Capacitor and Subthreshold Biasing, 2018 IEEE International Symposium on Circuits and Systems (ISCAS)

N. Shafiee, S. Tewari, B. Calhoun, A. Shrivastava Infrastructure Circuits for Lifetime Improvement of Ultra-Low Power IoT Devices, in IEEE Transactions on Circuits and Systems I: Regular Papers, 64(9), 2017, 2598-2610

N.E. Roberts, K. Craig, A. Shrivastava, S. Wooters,

Y. Shaksheer, D. Wentzloff, B.H. Calhoun 26.8 A 236nW -56.5dBm-Sensitivity Bluetooth Low-Energy Wakeup Receiver with Energy Harvesting In 65nm CMOS, IEEE International Solid-State Circuits Conference (ISSCC) Digest of Technical Papers, San Francisco, CA, 2016, 450-451

A. Shrivastava, D. Akella Kamakshi, B.H. Calhoun A 1.5 nW, 32.768 kHz XTAL Oscillator Operational From A

0.3 V Supply, IEEE Journal of Solid-State Circuits, 51(3), 2016, 686-696

SELECTED RESEARCH PROJECTS

Ultra-Low Power Analog Computing and Dry Skin-Electrode Contact Interface Design Techniques for Systems-On-A-Chip with EEG Sensing and Feature Extraction

Principal Investigator, National Science Foundation Novel Implantable Smart Magnetoelectric NanoRFIDs for Large-Scale Neural Magnetic Recording and Modulation Co-Principal Investigator, National Institute of Health

MILAD SIAMI



Assistant Professor, Electrical and Computer Engineering

PhD, Lehigh University, 2017 coe.northeastern.edu/people/siamimilad

Scholarship focus: sparse sensing and control in cyber-physical networks and

robotics; distributed systems theory and applications; network optimization and control; hard limits and tradeoffs in large-scale dynamical networks

SELECTED PUBLICATIONS

Y. Ghaedsharaf, M. Siami, C. Somarakis, N. Motee

Performance Improvement in Noisy Linear Consensus Networks with Time-Delay, IEEE Transactions on Automatic Control, 64(6), 2019, 2457-2472

M. Siami, N. Motee

Abstraction of Linear Dynamical Networks with Guaranteed Systemic Performance Measures, IEEE Transactions on Automatic Control, 63(10), 2018, 3301-3316

M. Siami, S. Bolouki, B. Bamieh, N. Motee

Centrality measures in Linear Consensus Networks with Structured Network Uncertainties, IEEE Transaction on Control of Network Systems, 5(3), 2018, 924-934

M. Siami, N. Motee

Growing Linear Dynamical Networks Endowed by Spectral Systemic Performance Measures, IEEE Transactions on Automatic Control, 63(7), 2018, 2091-2106

M. Siami, J. Skaf

Structural Analysis and Design of Distributed System Throttlers, IEEE Transactions on Automatic Control, 63(2), 2018, 540-547

S. Bolouki, R.P. Malhame, M. Siami, N. Motee

Eminence Grise Coalitions: On the Shaping of Public Opinion, IEEE Transactions on Control of Network Systems. 4(2), 2017, 133-145

M. Siami, N. Motee

New Spectral Bounds on H2-Norm of Linear Dynamical Networks, Automatica, 80, 2017, 305-312

M. Siami, N. Motee

Fundamental Limits and Tradeoffs on Disturbance Propagation in Large-Scale Dynamical Networks, IEEE Transactions on Automatic Control, 61(12), 2016, 4055-4062

MICHAEL B. SILEVITCH



Robert D. Black Professor, COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Civil and Environmental Engineering; Director, CenSSIS

PhD, Northeastern University, 1971 coe.northeastern.edu/people/ silevitch-michael

Scholarship focus: subsurface sensing and imaging systems, detection of explosives related anomalies, engineered system development and engineering leadership

Honors and awards: Life Fellow, Institute of Electrical and Electronics Engineers; 2015 National Academy of Engineering Gordon Prize, for developing an innovative method to provide graduate engineers with the necessary personal skills to become effective engineering leaders

SELECTED RESEARCH PROJECTS

ALERT: Awareness and Localization of Explosives Related Threats, A Department of Homeland Security Center of Excellence. ALERT seeks to conduct transformational research, technology and educational development for effective characterization, detection, mitigation and response to the explosives-related threats facing the country and the world

Director and Principal Investigator, Department of Homeland Security

CenSSIS: Center for Subsurface Sensing and Imaging Systems, Gordon-CenSSIS, a graduated NSF Engineering Research Center, was created to develop new technologies to detect hidden objects, and to use those technologies to meet real-world subsurface challenges in areas as diverse as noninvasive breast cancer detection and underground pollution assessment

Director and Principal Investigator, National Science Foundation

Research and Development of Reconstruction Advances in CT Based Object Detection Systems

Principal Investigator, Department of Homeland Security

HANUMANT SINGH



Professor, Electrical and Computer Engineering; jointly appointed, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 1995 coe.northeastern.edu/people/singhhanumant

Scholarship focus: robotic sensors, systems, platforms, and algorithms including high resolution optical and acoustic sensing; underwater vehicles (AUV, ROV, towed and manned vehicles), unmanned surface vehicles, and unmanned aerial systems; system architectures for navigation, docking and power; and the interactions between these subsystems

SELECTED PUBLICATIONS

H. Singh, W. Freeman, et al. Camouflaging an Object from Many Viewpoints, Proceedings of the 2014 Computer Vision and Pattern Recognition Conference, 1-8

C. Murphy, J. Walls, T. Schneider, H. Singh, et al. CAPTURE: A Communications Architecture for Progressive Transmission via Underwater Relays with Eavesdropping, IEEE Journal of Oceanic Engineering, 39(1), 2014, 1-13

K.E. Smith, H. Singh, et al.

Discovery of a Recent, Natural Whale Fall on the Continental Slope Off Anvers Island, Western Antarctic Peninsula, Deep Sea Research Part I: Oceanographic Research Papers, 90, 2014, 76-80

G. Williams, J. Wilkinson, T. Maksym, H. Singh, C. Kunz, et al.

Mapping Ice Thickness and Extreme Deformation of Antarctic Sea Ice from an Autonomous Underwater Vehicle, Nature Geoscience, 8, 2014, 61-67

M. Yi Cheung, J. Leighton, U. Mitra, H. Singh, F.S. Hover Performance of Bandit Methods in Acoustic Relay Positioning, Proceedings of the 2014 Automatic Control Conference, 2014, 4708-4714

C. Kunz, H. Singh

Map Building Fusing Acoustic and Visual Information Using Autonomous Underwater Vehicles, Journal of Field Robotics, 30(5), 2013, 1556-4967

H. Singh, K. Nakamura, M. Jakobssen, T. Shank, et al. Effusive and Explosive Volcanism on the Ultraslow-Spreading Gakkel Ridge, 85° E, Geochemistry, Geophysics, Geosystems, 13(10), 2012

EDUARDO SONTAG



University Distinguished Professor,

Electrical and Computer Engineering; jointly appointed, Bioengineering

PhD, University of Florida, 1977 coe.northeastern.edu/people/sontageduardo

Scholarship focus: feedback control theory, systems biology, cancer, and biomedicine

Honors and awards: IEEE Control Systems Field Award; IFAC Fellow; AMS Fellow; SIAM Fellow; IEEE Fellow; Reid Prize in Applied Mathematics, SIAM; Bode Prize, IEEE

SELECTED PUBLICATIONS

J.M. Greene, J.L. Gevertz, E.D. Sontag

A Mathematical Approach to Distinguish Spontaneous from Induced Evolution of Drug Resistance during Cancer Treatment, JCO Clinical Cancer Informatics, 3, 2019, 1-20

E.V. Nikolaev, A. Zloza, E.D. Sontag Immunobiochemical Reconstruction of Influenza Lung Infection -Melanoma Skin Cancer Interactions, Frontiers in Immunology, 10, 2019, 4

M. A. Al-Radhawi, D. Del Vecchio, E.D. Sontag Multi-Modality in Gene Regulatory Networks with Slow Gene Binding, PLoS Computational Biology, 15, 2019, e1006784

E.V. Nikolaev, S.J. Rahi, E.D. Sontag

Chaos in Simple Periodically-Forced Biological Models, Biophysical Journal, 114, 2018, 1232-1240

T.H. Segall-Shapiro, E.D. Sontag, C.A. Voigt Engineered Promoters Enable Constant Gene Expression

at any Copy Number in Bacteria, Nature Biotechnology, 36, 2018, 352-358

E.D. Sontag

A Dynamical Model of Immune Responses to Antigen Presentation Predicts Different Regions of Tumor or Pathogen Elimination, **Cell Systems**, 4, 2017, 1-11

SELECTED RESEARCH PROJECTS

Theory-Based Engineering of Biomolecular Circuits in Living Cells

Co-Principal Investigator, Air Force Office of Scientific Research

Model-Guided Discovery and Optimization of Navy-Relevant Cell-Based Sensors

Co-Principal Investigator, Office of Naval Research

Design Principles of Molecular Computing Using Engineered Enzymes

Co-Principal Investigator, National Science Foundation

DAGMAR STERNAD



University Distinguished Professor, Biology; jointly appointed: Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 1995 coe.northeastern.edu/people/sternaddagmar

Scholarship focus: motor control and learning, variability and stability, human-robot interaction, dynamic modeling

Honors and awards: Faculty of the Year, Award from Residential Life, Klein Lectureship Award; Distinguished Lecturer on Life and the Sciences of Complexity, University of Connecticut

SELECTED PUBLICATIONS

Z. Zhang, D. Sternad

The Primacy of Rhythm: How Discrete Actions Merge into a Stable Rhythmic Pattern, Journal of Neurophysiology, 121, 2019, 574-587

S. Bazzi, J. Ebert, N. Hogan, D. Sternad

Convergence and Predictability in Human Control of Dynamically Complex Objects, Chaos: An Interdisciplinary Journal of Nonlinear Science, 28(10), 2018, 103103

Z. Zhang, D. Guo, M.E. Huber, S.W. Park, D. Sternad Exploiting the Geometry of Solution Space to Reduce Sensitivity to Neuromotor Noise, PLoS Computational Biology, 14(2), 2018, e1006013

D. Sternad

It's Not (Only) the Mean that Matters: Variability, Noise and Exploration in Skill Acquisition, Current Opinion in Behavioral Sciences, 20, 2018, 183-195

P. Maurice, N. Hogan, D. Sternad

Predictability, Effort, and (Anti-)Resonance in Complex Object Control, Journal of Neurophysiology, 120(2), 2018, 765-780

SELECTED RESEARCH PROJECTS

Collaborative Research: Learning to Control Dynamically Complex Objects

Co-Investigator, National Science Foundation

Collaborative Research: Towards Robots with Human Dexterity

Principal Investigator, National Science Foundation

Predictability in Complex Object Control

Principal Investigator, National Institutes of Health

MILICA STOJANOVIC



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1993 coe.northeastern.edu/people/ stojanovic-milica

Scholarship focus: wireless communications and networks, coustic transmission, statistical system

underwater acoustic transmission, statistical system characterization, adaptive signal processing

Honors and awards: Distinguished Technical Achievement Award and Distinguished Lecturer, IEEE Ocean Engineering Society; Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

- R. Ahmed, M. Stojanovic Grouped Packet Coding: A Method for Reliable Communication Over Fading Channels With Long Delays, IEEE Journal of Oceanic Engineering, 99, 2018, 1-11
- A. Tadayon, M. Stojanovic

Low-Complexity Super-Resolution Frequency Offset Estimation for High Data Rate Acoustic OFDM Systems, IEEE Journal of Oceanic Engineering, 2018, 1-11

- R. Ahmed, M. Stojanovic Joint Power and Rate Control for Packet Coding Over Fading Channels, IEEE Journal of Oceanic Engineering, 42(3), 2016, 697-710
- Y. Aval, S.K. Wilson, M. Stojanovic Capacity of Acoustic Channels and Practical Power-Allocation Strategies, IEEE Journal of Oceanic Engineering, Special Issue on Underwater Communications, 40(4), 2015, 785-795
- Y. Aval, M. Stojanovic Differentially Coherent Multichannel Detection of Acoustic OFDM Signals, IEEE Journal of Oceanic Engineering, 40(2), 2015, 251-268
- P. Qarabaqi, M. Stojanovic Statistical Characterization and Computationally Efficient Modeling of a Class of Underwater Acoustic Channels, IEEE Journal of Oceanic Engineering, Special Issue on Underwater Communications, 38(4), 2013, 701-717

SELECTED RESEARCH PROJECTS

Active Communication, Sensing and Control in Actuated Underwater Sensing Networks

Principal Investigator, Office of Naval Research

Development of a Software-Defined Networking Testbed for the Internet of Underwater Things Principal Investigator, National Science Foundation

NIAN SUN



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Stanford University, 2002 coe.northeastern.edu/people/sun-nianxiang

Scholarship focus: micro/

nanofabricated sensors, including

antennas, electrochemical gas sensors, magnetic field sensors, strain and pressure sensors, etc.; magnetic, ferroelectric and magnetoelectric materials; RF/ microwave magnetic and magnetoelectric devices design, fabrication and testing; materials properties at RF/ microwave frequency

Honors and awards: Fellow, Institute of Physics; Fellow, Institute of Engineering and Technology; Office of Naval Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

Z. Wang, C. Dong, X. Wang, M. Li, T. Nan, X. Liang, H. Chen,
Y. Wei, H. Zhou, N.X. Sun
Highly Sensitive Integrated Flexible Tactile Sensors with
Piezoresistive Ge 2 Sb 2 Te 5 Thin Films, npj Flexible
Electronics, (1), 2018, 17
T. Nan, H. Lin, Y. Gao, A. Matyushov, G. Yu, H. Chen,

N. Sun, S. Wei, Z. Wang, N.X. Sun Acoustically Actuated Ultra-Compact NEMS Magnetoelectric Antennas, Nature communications, 8(1), 2017, 296

S. Emori, B.A. Gray, H.M. Jeon, J. Peoples, M. Schmitt, K. Mahalingam, M. Hill, N.X. Sun

Coexistence of Low Damping and Strong Magnetoelastic Coupling in Epitaxial Spinel Ferrite Thin Films, Advanced Materials 29(34), 2017, 1701130

Z. Zhou, M. Trassin, Y. Gao, Y. Gao, D. Chen, N.X. Sun Probing Electric Field Control of Magnetism Using Ferromagnetic Resonance, Nature Communications, 6, 2015, 6082

SELECTED RESEARCH PROJECTS

Novel Implantable Smart Magnetoelectric NanoRFIDs for Large-Scale Neural Magnetic Recording and Modulation Principal Investigator, National Institutes of Health

NSF Nanosystems Engineering Research Center (ERC) for Translational Applications of Nanoscale Multiferroic Systems (TANMS)

Co-Principal Investigator, National Science Foundation Engineering Research Centers

MARIO SZNAIER



Dennis Picard Trustee Professor, Electrical and Computer Engineering

PhD, University of Washington, 1989 coe.northeastern.edu/people/sznaiermario

Scholarship focus: robust control, control oriented identification, semi-

algebraic optimization, information extraction from high volume data streams, dynamics-enabled machine learning

Honors and awards: IEEE Control Systems Society Distinguished Member Award, IEEE Fellow

SELECTED PUBLICATIONS

W. Lucia, G. Franzè, M. Sznaier

A Hybrid Command Governor Scheme for Rotary Wings Unmanned Aerial Vehicles, IEEE Transactions on Control Systems Technology, 99, 2018, 1-15, early access

B. Yilmaz, K. Bekiroglu, C. Lagoa, M. Sznaier A Randomized Algorithm for Parsimonious Model Identification, IEEE Transactions on Automatic Control, 63(2), 2018, 532-539

Y. Wang, J. Lopez, M. Sznaier Convex Optimization Approaches to Information Structured Decentralized Control, IEEE Transactions on Automatic Control, 63(10), 2018, 3393-3403

K. Bekiroglu, M. Ayazoglu, C. Lagoa, M. Sznaier Hankel Matrix Rank as Indicator of Ghost in Bearing-Only Tracking, IEEE Transactions on Aerospace and Electronic Systems, 54(6), 2018, 2713-2723

M. Gou, F. Xiong, O. Camps, M. Sznaier MoNet: Moments Embedding Network, IEEE/CVF Conference on Computer Vision and Pattern Recognition, Salt Lake City, UT, 2018, 3175-3183

M. Sznaier, O. Camps

SoS-RSC: A Sum-of-Squares Polynomial Approach to Robustifying Subspace Clustering Algorithms, IEEE/CVF Conference on Computer Vision and Pattern Recognition, Salt Lake City, UT, 2018, 8033-8041

SELECTED RESEARCH PROJECTS

CRISP Type 2: Identification and Control of Uncertain, Highly Interdependent Processes Involving Humans with Applications to Resilient Emergency Health Response Principal Investigator, National Science Foundation

Data Driven Control of Switched Systems with Applications to Human Behavioral Modification Principal Investigator, National Science Foundation

Verifiable, Control-Oriented Learning on the Fly Principal Investigator at Northeastern University, Multidisciplinary University Research Initiatives, Air Force Office of Scientific Research

SRINIVAS TADIGADAPA



Professor and Chair of Electrical and Computer Engineering

PhD, Cambridge University, 1994 coe.northeastern.edu/people/ tadigadapa-srinvas

Scholarship focus: sensor devices and smart sensor systems realized

through interdisciplinary field of microelectromechanical systems (MEMS); including the design, optimization, fabrication, testing, and networking of such transducers; fabrication of novel micro and nano-sensors and actuators by integrating non-traditional materials using silicon planar microfabrication techniques and exploring phenomenon at the micro-nano interfaces; development of sustainable sensing solutions for biomedical applications including investigation of robust magnetic technologies for interfacing to the brain

Honors and awards: IEEE Fellow; Alexander von Humboldt Fellowship in Germany; Walton Fellowship, Science Foundation of Ireland; Fellow of the Institute of Physics, London; Life-Fellow of the Cambridge Philosophical Society; Founding Editor-in-Chief of IEEE Sensors Letters Journal

SELECTED PUBLICATIONS

D. Butler, N. Goel, L. Goodnight, S. Tadigadapa, A. Ebrahimi

Detection of Bacterial Metabolism in Lag-Phase using Impedance Spectroscopy of Agar-Integrated 3D Microelectrodes, Biosensors and Bioelectronics, 129, 2019, 269-276

D. Kumaran, D. Gaddes, E. Freeman, S. Tadigadapa, M. Panchagnula

Dynamical Similarity and Universality of Drop Size and Velocity Spectra in Sprays, Journal of Fluid Mechanics, 860, 2018, 510-543

C. Zhang, S. Tadigadapa

Modified Inductively Coupled Plasma Reactive Ion Etch Process for High Aspect Ratio Etching of Fused Silica, Borosilicate and Aluminosilicate Glass Substrates, Sensors and Actuators A: Physical, 273, 2018, 147-158

SELECTED RESEARCH PROJECTS

Continuous Urine Assay Instrumentation for Monitoring Kidney Function

Principal Investigator, National Science Foundation

Implantable Brain Microelectromechanical Magnetic Sensing and Stimulation (MEMS-MAGSS)

Co-Principal Investigator, National Institutes of Health

DEVESH TIWARI



Assistant Professor, Electrical and Computer Engineering

PhD, North Carolina State University, 2013 coe.northeastern.edu/people/tiwaridevesh

Scholarship focus: large scale

high performance computing systems; Data-intensive computing; cloud computing; machine learning and big data analytics

SELECTED PUBLICATIONS

J. Bhimani, T. Patel, N. Mi, D. Tiwari

What Does Vibration Do To Your SSD?, In Proceedings of the 56th Annual Design Automation Conference (DAC), 2019

N. Bin, J. Xue, S. Gupta, T. Patel, C. Engelmann, E. Smirni, D. Tiwari

Machine Learning Models for GPU Error Prediction in a Large Scale HPC System, In Proceedings of 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2018

L. Shuwen, Z. Qiao, J. Hochstetler, S. Huang, S. Fu, W. Shi, D. Tiwari, H.-B. Chen, B. Settlemyer, D. Montoya Reliability Characterization of Solid State Drives in a Scalable Production Datacenter, In Proceedings of the IEEE International Conference on Big Data, 2018

G. Rohan, T. Patel, G. Cooperman, D. Tiwari Shiraz: Exploiting System Reliability and Application Resilience Characteristics to Improve Large Scale System Throughput, In Proceedings of 48th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN), 2018

SELECTED RESEARCH PROJECTS

A Statistical Learning and Modeling Approach for Analyzing Failures in Heterogeneous Large-scale Systems Principal Investigator, Oak Ridge National Laboratory/ Department of Energy

MEWA: New Methods for Performance Benchmarking and Evaluation of Emerging Data-Intensive Workloads on Heterogeneous Computing Accelerators

Principal Investigator, MIT Lincoln Laboratory/Air Force Research Lab

Running Exascale-targeted HPC workloads in the Cloud at Lower Cost, Better Performance and with More Predictability Principal Investigator, Amazon

YANZHI WANG



Assistant Professor, Electrical and Computer Engineering

PhD, University of Southern California, 2014 coe.northeastern.edu/people/wang-yanzhi

Scholarship focus: energy-efficient and high-performance implementations of deep learning and artificial intelligence

systems; neuromorphic computing and non-von Neumann computing paradigms; cyber-security in deep learning systems; emerging deep learning algorithms/systems such as Bayesian neural networks, generative adversarial networks (GANs) and deep reinforcement learning

Honors and awards: IEEE International Conference on Acoustics, Speech, and Signal Processing, Best Paper Award, IEEE/ACM International Symposium on Low Power Electronic Design (ISLPED)

SELECTED PUBLICATIONS

J. Yue, R. Liu, W. Sun, Z. Yuan, Z. Wang, Y.-N. Tu, Y.-J. Chen, A. Ren, Y. Wang, et al.

A 65nm 0.39-to-140.3TOPS/W 1-to-12b Unified Neural Network Processor Using Block-Circulant-Enabled Transpose-Domain Acceleration With 8.1X Higher TOPS/mm2 and 6T HBST-TRAM-Based 2D Data-Reuse Architecture, in Proceedings of International Solid-State Circuits Conference (ISSCC), 2019

A. Ren, T. Zhang, S. Ye, J. Li, W. Xu, X. Qian, X. Lin, Y. Wang ADMM-NN: An Algorithm-Hardware Co-Design Framework of DNNs Using Alternating Direction Methods of Multipliers, in ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2019

R. Cai, A. Ren, O. Chen, N. Liu, C. Ding, X. Qian, J. Han, W. Luo, N. Yoshikawa, Y. Wang

A Stochastic-Computing Based Deep Learning Framework Using Adiabatic Quantum-Flux-Parametron Superconducting Technology, in Proceedings of International Symposium on Computer Architecture (ISCA), 2019

SELECTED RESEARCH PROJECTS

Fast and Accurate Memristor-Based Algorithms for Social Network Analysis

Principal Investigator, National Science Foundation

Enabling Multimodal Sensing, Real-Time Onboard Detection and Adaptive Control for Fully Autonomous Unmanned Aerial Systems

Co-Principal Investigator, National Science Foundation

Collaborative Research: Big Data Enabled Wireless Networking: A Deep Learning Approach Co-Principal Investigator, National Science Foundation

EDMUND YEH



Professor, Electrical and Computer Engineering

PhD, Massachusetts Institute of Technology, 2001 coe.northeastern.edu/people/yehedmund

Scholarship focus: data-centric

network architectures, fog/edge computing, resilient network infrastructures, network science, network information theory and coding, cross-layer control and optimization of wireless networks, network economics

Honors and awards: Alexander von Humboldt Research Fellowship; Army Research Office Young Investigator Award; Best Paper Award, IEEE International Conference on Communications (ICC), 2015; Best Paper Award, ACM Conference on Information-Centric Networking (ICN), 2017; Best Paper Award, IEEE International Conference on Ubiquitous and Future Networks (ICUFN), 2012; Faculty Research Team Award, 2017

SELECTED PUBLICATIONS

K. Kamran, E. Yeh, Q. Ma DECO: Joint Computation, Forwarding and Data Placement in Data-Driven Computing Networks, Proceedings of ACM MobiHoc, Catania, Italy, July 2-5, 2019

D. Malak, M. Medard, E. Yeh

Tiny Codes for Guaranteeable Delay, IEEE Journal on Selected Areas in Communications, 37(4), 2019, 809-825

S. Ioannidis, E. Yeh Adaptive Caching Network

Adaptive Caching Networks with Optimality Guarantees, IEEE/ACM Transactions on Networking, 26(2), 2018, 737-750

Y. Cui, M. Medard, E. Yeh, D. Leith, K. Duffy Optimization-Based Linear Network Coding for General Connections of Continuous Flows, IEEE/ACM Transactions on Networking, 26(5), 2018, 2033-2047

SELECTED RESEARCH PROJECTS

Generalized Network Assisted Transport (GNAT) Principal Investigator, Defense Advanced Research Projects Agency

Joint Optimization of Routing and Caching in Wireless Heterogeneous Networks

Principal Investigator, Intel Corporation

SDN-Assisted NDN for Data Intensive Experiments Principal Investigator, National Science Foundation

Parisa Andalib

PhD 2019, Electrical Engineering; Advisor, Vincent Harris

Enhanced Thermal Management in High Frequency Ferrite-Based Inductor Cores Via Grain Boundary Nanoengineering Strategies

Ferrite materials possess a unique combination of properties including permeability, permittivity, and low RF losses. There exist no other materials with such wide-ranging value to electronic applications in terms of power generation, conditioning, and conversion. These power management functions are required by not only enormous systems, such as our national power grid, but also our smaller systems, such as mobile communication platforms and components, where microinductors are integrated with semiconductor circuitry. These seemingly desperate needs provide bookends for the U.S. interests in size, frequency, and technology maturity to address societal needs in energy conservation and performance.

See full dissertation at coe.northeastern.edu/19/ParisaAndalib

Paraskevas Argyropoulos

PhD 2018, Electrical Engineering; Advisor, Hanoch Lev-Ari

Subband-Domain Universal Line Modeling for Robust Power System Transient Simulation

Currently available transient simulation packages which include frequency dependent transmission line (FDTL) elements rely on the use of either the J. Marti method or the Universal Line Modeling (ULM) method. The advantage of the J. Marti method is that the N-phase FDTL can be modeled by N-independent single-phase FDTL circuits which is very robust for transposed or nearly transposed FDTLs. The disadvantages of this method become evident as one deviates from the transposed-line assumption such as in the case of asymmetric-lines or underground cables. The Universal Line Modeling (ULM) method is a generalization of the J. Marti method and opts to model the FDTL directly in the phase-domain.

See full dissertation at coe.northeastern.edu/18/ParaskevasArgyropoulos

Junxiang Chen

PhD 2018, Computer Engineering; Advisor, Jennifer Dy

Interpretable Clustering Methods

Clustering is a task that divides objects into groups based on the similarity between objects. It is usually used as a tool for exploratory knowledge discovery, i.e., it is used to extract potentially useful and previously unknown knowledge from data, before experts have any insight. Because of the exploratory nature of clustering tasks, it is usually not adequate to simply provide clustering results that separate samples into groups. The domain scientists or data analysts in general also want to gain insight into the data. Therefore, it is desired to develop interpretable clustering models, which help the experts to attain deeper knowledge, by understanding what characterizes a cluster and how a cluster is distinguished from others.

See full dissertation at coe.northeastern.edu/18/JunxiangChen

Afsaneh Ghanavati

PhD 2018, Computer Engineering; Advisor, Hanoch Lev-Ari

A Sub-Cycle Approach to Dynamic Phasors with Application to Dynamic Power Quality Metrics

Emerging energy conversion systems are characterized by increased rates and magnitudes of transients due to distributed generation, feedback-controlled loads and new entities like microgrids. A characterization of power quality in transients is thus gaining in importance in all power networks. Dynamic phasors offer a natural way to extend metrics based on steady state quantities such as phasor magnitude and RMS values to transients. The widespread use of high-bandwidth sensors enables a characterization of both steady-state and transient operation. However, the volume of so generated data is such that it necessitates extensive pre-processing and extraction of events of interest in estimation and control. An important issue then becomes how to pre-process that input data set, hoping to avoid excessive storage, communication and computation requirements.

See full dissertation at coe.northeastern.edu/18/AfsanehGhanavati

Xiang Gong

PhD 2018, Computer Engineering; Advisor, David Kaeli

Improving GPU Performance Through Instruction Redistribution and Diversification

As throughput-oriented accelerators, GPUs provide tremendous processing power by executing a massive number of threads in parallel. However, exploiting high degrees of thread-level parallelism (TLP) does not always translate to the peak performance that GPUs can offer, leaving the GPUs resources often under-utilized.

See full dissertation at coe.northeastern.edu/18/XiangGong

Yuzhang Lin

PhD 2018, Electrical and Computer Engineering; Advisor, Ali Abur

Reliable and Efficient Methods for Identification of Parameter and Measurement Errors in Power Networks

The detection, identification, and correction of parameter and measurement errors (referred to as "error processing" below) are one of the core problems in the modeling and monitoring of electric power networks. In this dissertation, analyses and methodologies are proposed in order to tackle different aspects of this problem.

See full dissertation at coe.northeastern.edu/18/YuzhangLin

Xiangyu Li

PhD 2018, Computer Engineering; Advisor, David Kaeli

Exploiting Large-Scale Data Analytics Platforms with Accelerator Hardware

The volume of data being generated today across multiple application domains including scientific exploration, web search, e-commerce and medical research, has continued to grow unbounded. The value of leveraging machine learning to analyze big data has led to the growth in popularity of high-level distributed computing frameworks such as Apache Hadoop and Spark. These frameworks have significantly improved the programmability of distributed systems to accelerate big data analysis, whose workload is typically beyond the processing and storage capabilities of a single machine.

See full dissertation at coe.northeastern.edu/18/XiangyuLi

Yeganeh M Marghi

PhD 2019, Electrical Engineering; Advisor, Deniz Erdogmus

Event-driven Signal Model and Active Recursive Intent Estimation For Braincomputer Interfaces

Brain-Computer Interface (BCI) systems can provide a new pathway of communication and control that can be used in both medical and non-medical domains. Electroencephalogram (EEG) signals have been shown to be effective in inferring user intent in BCI applications. However, in many cases, EEG-based communication lacks sufficient accuracy and speed due to three major limitations: 1) inefficient learning process (querying) to gain information for inference, 2) excessive querying to surpass a hard pre-defined threshold, and 3) insufficient classification performance to estimate the user intent.

See full dissertation at

coe.northeastern.edu/19/Yeganeh M Marghi

SELECTED PhD THESES

Luis Tirado

PhD 2019, Electrical Engineering; Advisor, Jose Martinez-Lorenzo

On-the-move Detection Of Security Threats Using 3d Mm-Wave Radar Imaging

There is a critical need to develop new imaging systems capable of detecting security threats, both at nearfield ranges (1-5m) and standoff ranges (10-40 meters). Millimeter wave (mm-wave) radar possesses unique features that makes it well-suited for addressing such a need; these include but are not limited to the following: (i) ability to penetrate through clothing, thus revealing potential threats that may be concealed under clothing; (ii) ability to provide depth information and complex scattering signatures, so it can detect and differentiate between weak dielectric and strong metallic threats, like TNT or metallic pipes and shrapnel.

See full dissertation at coe.northeastern.edu/19/LuisTirado

Chenxi Xu

PhD 2019, Electrical Engineering; Advisor, Ali Abur

Computationally Efficient PMU-Based L1 Estimators for Large Power Systems

Phasor Measurement Units (PMUs) are increasingly deployed in power systems because of their nice characteristics like fast data acquisition rate and GPS clock synchronization. With the explicit usage of PMU measurements, Least Absolute Value (LAV) State Estimator (SE), together with its built-in Bad Data (BD) rejection capability, can be formulated as a Linear Programming (LP) problem and solved efficiently by highperformance LP solvers. This dissertation reviews the foundational research on power system state estimation and proposes several novel LAV SEs with high robustness and computational performance for Very Large Scale Interconnected (VLSI) power grids when the system is measured by only PMUs.

See full dissertation at coe.northeastern.edu/19/ChenxiXu

Zhengyu Yang

PhD 2018, Computer Engineering; Advisor, Ningfang Mi

Flash-Based Storage Management in Cloud Computing Datacenter Infrastructure

A basic credendum of cloud computing can be summarized as: user devices are light terminals to assign jobs and gather results, while those heavy computations are conducted on remote distributed server clusters. This light-terminal-heavy-server structure makes high availability no longer an option, but a requirement in todays datacenters. Furthermore, when bringing compute and storage capabilities into balance, we find that the biggest challenge here is closing the gap between compute and storage performance to shift storages curve back towards Moores law. In detail, the time consumed to wait for I/Os is the main cause of idling and wasting CPU resources, since a large number of popular cloud applications are I/O intensive, such as video streaming, file sync and backup, and data iteration for machine learning.

See full dissertation at coe.northeastern.edu/19/ZhengyuYang

Professor Hanumant Singh, electrical and computer engineering, jointly appointed in mechanical and industrial engineering, works with PhD student Pushyami Kaveti on the electronic housing end caps for the Seabed in the Interdisciplinary Science and Engineering Complex at Northeastern University.



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COVER IMAGE

Hui Fang, an assistant professor of electrical and computer engineering at Northeastern, has developed a new neurotechnology to allow simultaneous electrical and optical brain mapping at high resolution.

