ELECTRICAL AND COMPUTER ENGINEERING (ECE)
at the
University of Michigan

RECENT FACULTY PUBLICATIONS,
PATENTS, AND CURRENT STUDENTS
2018
ECE at Michigan is a top-ranked, world-class department that is pushing the boundaries of research in the most high-tech and innovative areas affecting society. Our faculty and students are relentless in their pursuit of excellence, and apply their knowledge and skills to the needs of society.

At Michigan ECE, students learn, create, play, make lifelong friends, and one day join an enormous network of 19,000 welcoming alumni. Our graduate program is designed around the excellence, diversity, and curiosity of our students.

This document provides current and prospective students a summary of recent research publications and related information about tenure and tenure-track faculty in Electrical and Computer Engineering (ECE) at the University of Michigan.

Michigan ECE faculty specialize in the areas listed below, while continually reaching into new areas and collaborating across disciplines with faculty throughout the University of Michigan, the country, and the world. The University of Michigan has about 100 graduate programs ranked in the top 10 by U.S News & World Report, including ECE.

Get ready to change the world by sharpening your expertise in any of the following areas:

- Applied Electromagnetics & RF Circuits
- Computer Vision
- Control Systems
- Embedded Systems
- Integrated Circuits & VLSI
- MEMS & Microsystems
- Network, Communication, and Information Systems
- Optics & Photonics
- Power & Energy
- Robotics
- Signal & Image Processing and Machine Learning
- Solid State & Nanotechnology
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Afshari, Ehsan

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Research Interests: High frequency circuits and systems for imaging, bio-sensing, and high data rate communication.

Recent Publications

- A 308-317GHz source with 4.6mW peak radiated power and on-chip frequency-stabilization feedback in 0.13mm BiCMOS, Jiang C., Aseeri M., Cathelin A., Afshari E., Digest of Papers - IEEE Radio Frequency Integrated Circuits Symposium, 08/07/2018
- A Single-Stage Soft-Switching High-Frequency AC-Link PV Inverter: Design, Analysis, and Evaluation of Si-based and SiC-based Prototypes, Khodabandeh M., Afshari E., Amirabadi M., IEEE Transactions on Power Electronics, 06/12/2018
- H8 Inverter to Reduce Leakage Current in Transformerless Three-Phase Grid-Connected Photovoltaic systems, Rahimi R., Farhangi S., Farhangi B., Moradi G., Afshari E., Blaabjerg F., IEEE Journal of Emerging and Selected Topics in Power Electronics, 06/01/2018
- A Single-Stage Capacitive AC-Link AC-AC Power Converter, Afshari E., Khodabandeh M., Amirabadi M., IEEE Transactions on Power Electronics, 05/26/2018
- A series-AC-link ISOP AC-AC converter with two power cells, Afshari E., Amirabadi M., Conference Proceedings - IEEE Applied Power Electronics Conference and Exposition - APEC, 04/18/2018
- A 301.7-to-331.8GHz source with entirely on-chip feedback loop for frequency stabilization in 0.mm BiCMOS, Jiang C., Aseeri M., Cathelin A., Afshari E., Digest of Technical Papers - IEEE International Solid-State Circuits Conference, 03/08/2018
- A 173 GHz Amplifier with a 18.5 dB Power Gain in a 130 nm SiGe Process: A Systematic Design of High-Gain Amplifiers above f_{max}/2, Khatibi H., Khiyabani S., Afshari E., IEEE Transactions on Microwave Theory and Techniques, 01/01/2018
- A 0.92-THz SiGe Power Radiator Based on a Nonlinear Theory for Harmonic Generation, Aghasi H., Cathelin A., Afshari E., IEEE Journal of Solid-State Circuits, 2/1/2017
• A 173 GHz Amplifier with a 18.5 dB Power Gain in a 130 nm SiGe Process: A Systematic Design of High-Gain Amplifiers above f max /2, Khatibi H., Khiyabani S., Afshari E., IEEE Transactions on Microwave Theory and Techniques, 1/1/2018

• A 195 GHz single-transistor fundamental VCO with 15.3% DC-to-RF efficiency, 4.5 mW output power, phase noise FoM of -197 dBc/Hz and 1.1% tuning range in a 55 nm SiGe process, Khatibi H., Khiyabani S., Cathelin A., Afshari E., Digest of Papers - IEEE Radio Frequency Integrated Circuits Symposium, 7/5/2017

• A compact ultra-wide-band frequency divider with a locking range of 12-61 GHz with 0dBm of input power, Mostajeran A., Emadi M., Cathelin A., Afshari E., IEEE MTT-S International Microwave Symposium Digest, 10/4/2017


• An Efficient High-Power Fundamental Oscillator above f max /2 : A Systematic Design, Khatibi H., Khiyabani S., Afshari E., IEEE Transactions on Microwave Theory and Techniques, 11/1/2017

• An ultra-wideband harmonic radiator with a tuning range of 62GHz (28.3%) at 220GHz, Mostajeran A., Afshari E., Digest of Papers - IEEE Radio Frequency Integrated Circuits Symposium, 7/5/2017


• Towards efficient high power mm-wave and terahertz sources in silicon: One decade of progress, Khatibi H., Afshari E., SiRF 2017 - 2017 IEEE 17th Topical Meeting on Silicon Monolithic Integrated Circuits in RF Systems, 3/8/2017

Students Advised

• Lili Chen, ECE PHD (admitted 2018)
• Bahareh Hadidian, ECE PHD (admitted 2018)
• Zainulabideen Khalifa, ECE PHD (admitted 2017)
• Farzad Khoeini, ECE PHD (admitted 2017)
• Seyyedmohammadhossein Naghavi, ECE PHD (admitted 2018)
• Morteza Tavakoli Taba, ECE PHD (admitted 2018)
Ahmadi, Elaheh

Research Interests: Epitaxial growth and characterization of III-N and Oxide semiconductor materials for electronic and optoelectronics devices, sensing and MEMs applications as well as electron transport modeling.

Recent Publications

- Deep level defects in Ge-doped (010) b-Ga$_2$O$_3$ layers grown by plasma-assisted molecular beam epitaxy, Farzana E., Ahmadi E., Speck J., Arehart A., Ringel S., Journal of Applied Physics, 04/28/2018
- N-type dopants in (001) b-Ga$_2$O$_3$ grown on (001) b-Ga$_2$O$_3$ substrates by plasma-assisted molecular beam epitaxy, Han S., Mauze A., Ahmadi E., Mates T., Oshima Y., Speck J., Semiconductor Science and Technology, 03/01/2018
- Establishment of design space for high current gain in III-N hot electron transistors, Gupta G., Ahmadi E., Suntrup D., Mishra U., Semiconductor Science and Technology, 01/01/2018
- Growth and etching characteristics of (001) b-Ga$_2$O$_3$ by plasma-assisted molecular beam epitaxy, Oshima Y., Ahmadi E., Kaun S., Wu F., Speck J., Semiconductor Science and Technology, 01/01/2018
- Demonstration of constant 8 W/mm power density at 10, 30, and 94 GHz in state-of-the-art millimeter-wave N-polar GaN MISHEMTs, Romanczyk B., Wienecke S., Guidry M., Li H., Ahmadi E., Zheng X., Keller S., Mishra U., IEEE Transactions on Electron Devices, 01/01/2018
Students Advised

- Zhe Jian, ECE PHD (admitted 2018)
- Kamruzzaman Khan, MSE PHD (admitted 2018)
- Subhajit Mohanty, ECE PHD (admitted 2018)
- Sandra Diez Pinzon, Applied Physics PhD (admitted 2018)
Anastasopoulos, Achilleas

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Research Interests: Resource allocation on networked systems with emphasis on analysis of dynamic games and mechanism design; Information theory with emphasis on fundamental QoS limits in multiuser environments; Communication theory with emphasis on design of capacity-achieving transmission schemes for noisy channels.

Recent Publications

- A systematic process for evaluating structured perfect Bayesian equilibria in dynamic games with asymmetric information, Vasal D., Sinha A., Anastasopoulos A., IEEE Transactions on Automatic Control, 01/2019
- Mechanism design for resource allocation in networks with intergroup competition and intragroup sharing, Sinha A., Anastasopoulos A., IEEE Transactions on Control of Network Systems, 09/2018
- On the reliability function of discrete memoryless multiple-access channel with feedback, M. Heidari, A. Anastasopoulos, and S. Sandeep Pradhan, IEEE Information Theory Workshop (ITW), 11/2018
- Characterizing Non-Myopic Information Cascades in Bayesian learning, I. Bistritz and A. Anastasopoulos, IEEE Conference on Decision and Control (CDC), 12/2018
- Distributed mechanism design for multicast transmission, N. Heydaribeni and A. Anastasopoulos, IEEE Conference on Decision and Control (CDC), 12/2018
- Distributed Mechanism Design for Unicast Transmission, N. Heydaribeni and A. Anastasopoulos, Information Theory and Applications (ITA), 2/2018
- Distributed mechanism design with learning guarantees, A. Sinha and A. Anastasopoulos, IEEE Conf. on Decision and Control (CDC), 12/2017
- Linear quadratic games with costly measurements, D. Maity, A. Anastasopoulos, and J. Baras, IEEE Conf. on Decision and Control (CDC), 12/2017
• Variable-length codes for channels with memory and feedback: Error-exponent lower bounds, Anastasopoulos A., Wu J., IEEE International Symposium on Information Theory (ISIT), 6/2017

Students Advised

• Nasimeh Heydaribeni, ECE PHD (admitted 2017)
Avestruz, Al-Thaddeus

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Recent Publications

- Performance Comparisons of Synchronous and Uncontrolled Rectifiers for 27.12 MHz Wireless Power Transfer Using CMCD Converters, Zan X., Avestruz A., 2018 IEEE Energy Conversion Congress and Exposition, ECCE 2018, 12/03/2018
- Comparison of switched receivers for direct-sequence spread-spectrum wireless power transfer, Sarin A., Cui X., Avestruz A., 2017 IEEE 18th Workshop on Control and Modeling for Power Electronics, COMPEL 2017, 8/18/2017
- Transfer-power measurement: A non-contact method for fair and accurate metering of wireless power transfer in electric vehicles, Chu S., Avestruz A., 2017 IEEE 18th Workshop on Control and Modeling for Power Electronics, COMPEL 2017, 8/18/2017
- Wireless power transfer for implantable medical devices using piecewise resonance to achieve high peak-To-Average power ratio, Zan X., Avestruz A., 2017 IEEE 18th Workshop on Control and Modeling for Power Electronics, COMPEL 2017, 8/18/2017
**Patents Issued**


**Students Advised**

- Sung Yul Chu, ECE PHD (admitted 2016)
- Xiaofan Cui, ECE PHD (admitted 2016)
- Alireza Ramyar, ECE PHD (admitted 2018)
- Akshay Sarin, ECE PHD (admitted 2016)
- Xin Zan, ECE PHD (admitted 2016)
Balzano, Laura

Website: http://web.eecs.umich.edu/~girasole/

Research Interests: Statistical signal processing, machine learning, and optimization theory and methods for dealing with large complex data.

Recent Publications

- Improving K-Subspaces via Coherence Pursuit, Gitlin A., Tao B., Balzano L., Lipor J., IEEE Journal on Selected Topics in Signal Processing, 12/01/2018
- Learning dictionary-based unions of subspaces for image denoising, Hong D., Malinas R., Fessler J., Balzano L., European Signal Processing Conference, 11/29/2018
- Exploring Connections between a Multiple Model Kalman Filter and Dynamic Fixed Share with Applications to Demand Response, Ledva G., Balzano L., Mathieu J., 2018 IEEE Conference on Control Technology and Applications, CCTA 2018, 10/26/2018
- The Landscape of Non-Convex Quadratic Feasibility, Bower A., Jain L., Balzano L., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 09/10/2018
- Asymptotic performance of PCA for high-dimensional heteroscedastic data, Hong D., Balzano L., Fessler J., Journal of Multivariate Analysis, 09/01/2018
- Real-Time Energy Disaggregation of a Distribution Feeder's Demand Using Online Learning, Ledva G., Balzano L., Mathieu J., IEEE Transactions on Power Systems, 09/01/2018
- Streaming PCA and Subspace Tracking: The Missing Data Case, Balzano L., Chi Y., Lu Y., Proceedings of the IEEE, 08/01/2018
• Enhanced online subspace estimation via adaptive sensing, Ongie G., Hong D., Zhang D., Balzano L., Conference Record of 51st Asilomar Conference on Signals, Systems and Computers, ACSSC 2017, 04/10/2018
• Online dynamic MRI reconstruction via robust subspace tracking, Ongie G., Dewangan S., Fessier J., Balzano L., 2017 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2017 - Proceedings, 03/07/2018
• Low algebraic dimension matrix completion, Pimentel-Alarcon D., Ongie G., Balzano L., Willett R., Nowak R., 55th Annual Allerton Conference on Communication, Control, and Computing, Allerton 2017, 01/17/2018
• A Robust Algorithm for Online Switched System Identification*, Du Z., Balzano L., Ozay N., IFAC-PapersOnLine, 01/01/2018
• Distance-Penalized Active Learning Using Quantile Search, Lipor J., Wong B., Scavia D., Kerkez B., Balzano L., IEEE Transactions on Signal Processing, 10/15/2017
• Matched subspace detection using compressively sampled data, Zhang D., Balzano L., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 6/16/2017
• Mixture regression as subspace clustering, Pimentel-Alarcon D., Balzano L., Marcia R., Nowak R., Willett R., 2017 12th International Conference on Sampling Theory and Applications, SampTA 2017, 9/1/2017
• On learning high dimensional structured single index models, Ganti R., Rao N., Balzano L., Willett R., Nowak R., 31st AAAI Conference on Artificial Intelligence, AAAI 2017, 1/1/2017

Students Advised

• Amanda Bower, Applied & Interdisciplinary Mathematics PHD (co-advised)
• Tyler Doiron, ECE Master's (co-advised)
• Zhe Du, ECE PHD (co-advised) (admitted 2017)
• Kyle Gilman, ECE PHD (admitted 2017)
• David Hong, ECE PHD (co-advised) (admitted 2013)
• Alexander Ritchie, ECE PHD (co-advised) (admitted 2017)
• Yutong Wang, ECE PHD (co-advised) (admitted 2016)
• Dejiao Zhang, ECE PHD (admitted 2013)
Berenson, Dmitry

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Research Interests: Motion planning and machine learning for robotic manipulation.

Recent Publications

- Motion Planning for Manipulators in Unknown Environments with Contact Sensing Uncertainty, Brad Saund and Dmitry Berenson, International Symposium on Experimental Robotics (ISER), November 2018.
- Incremental Segmentation of ARX Models, Chou G., Ozay N., Berenson D., IFAC-PapersOnLine, 01/01/2018
- What happened at the DARPA robotics challenge finals, Atkeson C., Benzun P., Banerjee N., Berenson D., Bove C., Cui X., DeDonato M., Du R., Feng S., Franklin P., Gennert M.,


**Students Advised**

- Glen Chou, ECE PHD (co-advised) (admitted 2017)
- Yu-Chi Lin, ROB PHD
- Peter Mitrano, ROB PHD
- Dale McConachie, ROB PHD
- Tom Power, ROB PHD
- Bradley Saund, ROB PHD
- Johnson Zhong, ROB PHD
Bhattacharya, Pallab

Website: https://bhattacharya.engin.umich.edu/

Research Interests: Molecular beam epitaxy, low-dimensional quantum confined systems, quantum dot lasers and detectors, optoelectronic integrated circuits, spintronic devices.

Recent Publications

- Spin-injection-induced gain anisotropy in a polariton diode laser, Bhattacharya A., Bhattacharya P., Physical Review B, 02/14/2018
- Shape Evolution of Highly Lattice-Mismatched InN/InGaN Nanowire Heterostructures, Yan L., Hazari A., Bhattacharya P., Millunchick J., Journal of Electronic Materials, 02/01/2018
- Shape Evolution of Highly Lattice-Mismatched InN/InGaN Nanowire Heterostructures, Yan L., Hazari A., Bhattacharya P., Millunchick J., Journal of Electronic Materials, 2/1/2018
• High-resolution nonlinear optical spectroscopy of InGaN quantum dots in GaN nanowires, Nelson C., Deshpande S., Liu A., Jahangir S., Bhattacharya P., Journal of the Optical Society of America B: Optical Physics, 6/1/2017
• Room temperature GaN-based edge-emitting spin-polarized light emitting diode, Bhattacharya A., Baten Z., Frost T., Bhattacharya P., IEEE Photonics Technology Letters, 2/1/2017
• III-nitride nanowire array based 1.3mm monolithic photonic integrated circuit on (001) silicon substrate, Hazari A., Heo J., Bhattacharya P., Optics InfoBase Conference Papers, 1/1/2017
• Room Temperature GaN-Based Edge-Emitting Spin-Polarized Light Emitting Diode, A. Bhattacharya, Md. Z. Baten, T. Frost, and P. Bhattacharya, IEEE Photonics Technology Letters, 1/1/2017
• Spin-Injection Induced Gain Anisotropy in a Polarity Diode Laser, A. Bhattacharya and P. Bhattacharya, Physical Review B, 1/1/2018

Students Advised

• Anthony Aiello, ECE PHD (admitted 2016)
• Ayush Pandey, ECE PHD (co-advised) (admitted 2017)
Blaauw, David

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Research Interests: Low power and high performance VLSI design; Low power wireless sensors and embedded systems.

Recent Publications

- A 2.2 NEF Neural-Recording Amplifier Using Discrete-Time Parametric Amplification, Jang T., Lim J., Choo K., Nason S., Lee J., Oh S., Jeong S., Chestek C., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 10/22/2018
- A 28NM Integrated True Random Number Generator Harvesting Entropy from MRAM, Yang K., Dong Q., Wang Z., Shih Y., Chih Y., Chang J., Blaauw D., Sylvester D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 10/22/2018
• A receiver/antenna co-design for a 1.5mJ per fix fully-integrated 10x10x6mm³ GPS logger, Kim H., Chiotellis N., Ansari E., Faisal M., Jang T., Grbic A., Blaauw D., Wentzloff D., 2018 IEEE Custom Integrated Circuits Conference, CICC 2018, 05/09/2018
• A 4 + 2T SRAM for Searching and In-Memory Computing with 0.3-VDDmin, Dong Q., Jeloka S., Saligane M., Kim Y., Kawaminami M., Harada A., Miyoshi S., Yasuda M., Blaauw D., Sylvester D., IEEE Journal of Solid-State Circuits, 04/01/2018
• Harmonium: Ultra wideband pulse generation with bandstitched recovery for fast, accurate, and robust indoor localization, Pannuto P., Kempke B., Chuo L., Blaauw D., Dutta P., ACM Transactions on Sensor Networks, 03/01/2018
• A 42nJ/conversion on-demand state-of-charge indicator for miniature IoT Li-ion batteries, Jeong J., Jeong S., Kim C., Sylvester D., Blaauw D., Proceedings of the Asia and South Pacific Design Automation Conference, ASP-DAC, 02/20/2018
• Edge pursuit comparator with application in a 74.1dB SNDR, 20KS/s 15b SAR ADC, Shim M., Jeong S., Myers P., Bang S., Shen J., Kim C., Sylvester D., Blaauw D., Jung W., Proceedings of the Asia and South Pacific Design Automation Conference, ASP-DAC, 02/20/2018
• IRazor: Current-Based Error Detection and Correction Scheme for PVT Variation in 40-nm ARM Cortex-R4 Processor, Zhang Y., Khayatzadeh M., Yang K., Saligane M., Pinckney N., Alioto M., Blaauw D., Sylvester D., IEEE Journal of Solid-State Circuits, 02/01/2018
• A 42 nJ/Conversion On-Demand State-of-Charge Indicator for Miniature IoT Li-Ion Batteries, Jeong J., Jeong S., Sylvester D., Blaauw D., Kim C., IEEE Journal of Solid-State Circuits, 01/01/2018
• A Noise Reconfigurable All-Digital Phase-Locked Loop Using a Switched Capacitor-Based Frequency-Locked Loop and a Noise Detector, Jang T., Jeong S., Jeon D., Choo K., Sylvester D., Blaauw D., IEEE Journal of Solid-State Circuits, 01/01/2018
• Always-On 12-nW Acoustic Sensing and Object Recognition Microsystem for Unattended Ground Sensor Nodes, Jeong S., Chen Y., Jang T., Tsai J., Blaauw D., Kim H., Sylvester D., IEEE Journal of Solid-State Circuits, 01/01/2018
• Low-Power Switched-Capacitor Converter Techniques for Small IoT Systems, Wanyeong Jung, Dennis Sylvester, David Blaauw, European Conference on Circuit Theory and Design, 9/1/2017
• A Fully Integrated Counter Flow Energy Reservoir for Peak Power Delivery in Small Form-Factor Sensor Systems, Xiao Wu, Kyojin Choo, Yao Shi, Li-Xuan Chuo, Dennis Sylvester, David Blaauw, Invited paper to the Special issue on ISSCC 2017, 12/1/2017
• iRazor: Current-Based Error Detection and Correction for PVT Variation Tolerance in 40-nm ARM Cortex-R4 Processor, Yiqun Zhang, Mahmood Khayatzadeh, Kaiyuan Yang, Mehdi Saligane, Nathaniel Pinckney, Massimo Alioto, David Blaauw, Dennis Sylvester, IEEE Journal of Solid State Circuits, 2/1/2018
• A $1920 \times 1080$ 30-frames/s 2.3 TOPS/W Stereo-Depth Processor for Energy-Efficient Autonomous Navigation of Micro Aerial Vehicles, Ziyun Li, Qing Dong, Mehdi Saligane, Benjamin Kempke, Luyao Gong, Zhengya Zhang, Ron Dreslinski, David Blaauw, Hun Seok Kim, Invited Paper to the Special Issue on ISSCC 2017, 9/1/2017
• Infrared Energy Harvesting in mm-Scale GaAs Photovoltaics, Eunseong Moon, David Blaauw, Jamie Phillips, IEEE Transactions on Electron Devices, 9/1/2017
• Low-Power and Compact Analog-to-Digital Converter Using Spintronic Racetrack Memory Devices, Qing Dong, Kaiyuan Yang, Laura Fick, David Fick, David Blaauw, Dennis Sylvester, IEEE Transactions on Very Large Scale Integration Systems, 3/1/2017
• Edge-Pursuit Comparator: An Energy-Scalable Oscillator Collapse-Based Comparator with Application in a 74.1dB SNDR, 20kS/s 15b SAR ADC, Minseob Shim, Seokhyeon Jeong, Paul Myers, SuYoung Bang, Chulwoo Kim, Dennis Sylvester, David Blaauw, Wanyeong Jung, IEEE Journal of Solid State Circuits Invited Paper to the Special Issue, 4/1/2017
• A Subthreshold Voltage Reference with Scalable Output Voltage for Low-Power IoT Systems, Inhee Lee, Dennis Sylvester, David Blaauw, IEEE Journal of Solid State Circuits, 1/1/2017
• Subthreshold Voltage Reference With Nwell/Psub Diode Leakage Compensation for Low-Power High-Temperature Systems, Inhee Lee, Dennis Sylvester, David Blaauw, IEEE Asian Solid-State Circuits Conference, 11/1/2017
• RF-Echo: A Non-Line-of-Sight Indoor Localization System Using a Low-Power Active RF Reflector ASIC Tag, Li-Xuan Chuo, Zhihong Luo, Dennis Sylvester, David Blaauw, Hun-Seok Kim, International Conference on Mobile Computing and Networking, 10/1/2017
• A 1.02nW PMOS-Only, Trim-Free Current Reference with 282ppm/°C from -40°C to 120°C and 1.6% within-Wafer Inaccuracy, Qing Dong, Inhee Lee, Kaiyuan Yang, David Blaauw, Dennis Sylvester, IEEE European Solid-State Circuits Conference, 9/1/2017
• A 1.7nW PLL-Assisted Current Injected 32KHz Crystal Oscillator for IoT, Yu Zeng, Taekwang Jang, Qing Dong, Mehdi Saligane, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, Taiji Ema, Makoto Yasunda, Kazuyuki Kumen, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• An ultra-wide program, 122pJ/bit flash memory using charge recycling, Supreet Jeloka, Jeongsup Lee, Ziyun Li, Jinal Shah, Qing Dong, Kaiyuan Yang, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• A sequence dependent challenge-response PUF using 28nm SRAM 6T bit cell, Supreet Jeloka, Kaiyuan Yang, Michael Orshansky, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 42nJ/conversion On-Demand State-of-Charge Indicator for Miniature IoT Li-ion Batteries, Junwon Jeong, Seokhyeon Jeong, Chulwoo Kim, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 0.3V VDDmin 4+2T SRAM for Searching and In-Memory Computing Using 55nm DDC Technology, Qing Dong, Supreet Jeloka, Mehdi Saligane, Yejoong Kim, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, David Blaauw, Dennis Sylvester, IEEE Symposium on VLSI Circuits (VLSI-Symp), Invited Paper to the IEEE Journal of Solid States Circuits, 6/1/2017
• Recryptor: A Reconfigurable In-Memory Cryptographic Cortex-M0 Processor for IoT, Yiqun Zhang, Li Xu, Jingcheng Wang, Kaiyuan Yang, Qing Dong, Supreet Jeloka, David Blaauw, Dennis Sylvester, Invited Paper to the IEEE Journal of Solid States Circuits (JSSC), Special Issue on VSL, 6/1/2017
• A 4.7µW Switched-Bias MEMS Microphone Preamplifier for Ultra-Low-Power Voice Interfaces, Sechang Oh, Taekwang Jang, Kyojin D. Choo, David Blaauw, Dennis Sylvester, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 6×5×4mm3 General Purpose Audio Sensor Node with a 4.7µW Audio Processing IC, Minchang Cho, Sechang Oh, Seokhyeon Jeong, Yiqun Zhang, Inhee Lee, Yejoong Kim, Li-Xuan Chuo, Dongkwun Kim, Qing Dong, Yen-Po Chen, Martin Lim, Mike Daneman, David Blaauw, Dennis Sylvester, Hun-Seok Kim, IEEE Symposium on VLSI Circuits, 6/1/2017
• Rectified-linear and Recurrent Neural Networks Built with Spin Devices, Qing Dong, Kaiyuan Yang, Laura Fick, David Blaauw, Dennis Sylvester, IEEE International Symposium on Circuits and Systems, 5/1/2017
• Analog In-Memory Subthreshold Deep Neural Network Accelerator, Laura Fick, Skylar Skrzyniarz, Malav Parikh, David Fick, David Blaauw, Dennis Sylvester, IEEE Custom Integrat-ed Circuits Conference, 5/1/2017
• Always-On 12nW Acoustic Sensing and Object Recognition Microsystem for Unattended Ground Sensor Nodes, Seokhyeon Jeong, Yu Chen, Julius Tsai, Taekwang Jang, David Blaauw, Hun-Seok Kim, Dennis Sylvester, IEEE International Solid-State Circuits Conference, 2/1/2017
• A 1920×1080 30fps 2.3TOPS/W Stereo-Depth Processor for Robust Autonomous Navigation, Ziyun Li, Qing Dong, Mehdi Saligane, Benjamin Kempke, Shijia Yang, Zhengya Zhang, Ronald Dreslinski, Dennis Sylvester, David Blaauw, Hun Seok Kim, IEEE International Solid-State Circuits Conference, 2/1/2017
• A 0.6nJ -0.22/+0.19°C Inaccuracy Temperature Sensor Using Exponential Subthreshold Oscillation Dependence, Kaiyuan Yang, Qing Dong, Wanyeong Jung, Yiqun Zhang, Myungjoon Choi, David Blaauw, Dennis Sylvester, EEE International Solid-State Circuits Conference, 2/1/2017
• A 553F2 2-Transistor Amplifier-Based Physically Unclonable Function (PUF) with 1.67% Native Instability, Kaiyuan Yang, Qing Dong, David Blaauw, Dennis Sylvester, EEE International Solid-State Circuits Conference, 2/1/2017

• A 380pW Dual Mode Optical Wake-up Receiver with Ambient Noise Cancellation, Wooteak Lim, Taekwang Jang, Inhee Lee, Hun-Seok Kim, Dennis Sylvester, David Blaauw, EEE International Solid-State Circuits Conference, 2/1/2017

• A 1Mb Embedded NOR Flash Memory with 39μW Program Power for mm-Scale High-Temperature Sensor Nodes, Qing Dong, Yejoong Kim, Inhee Lee, Myungjoon Choi, Ziyun Li, Jingcheng Wang, Kaiyuan Yang, Yen-Po Chen, Junjie Dong, Minchang Cho, Gyouho Kim, Wei-Keng Chang, Yun-Sheng Chen, Yu-Der Chih, David Blaauw, Dennis Sylvester, EEE International Solid-State Circuits Conference, 2/1/2017


• A 2.5ps 0.8-to-3.2GHz Bang-Bang Phase- and Frequency-Detector-Based All-Digital PLL with Noise Self-Adjustment, Taekwang Jang, Soekhyeon Jeong, Dongsuk Jeon, Kyojin Choo, Dennis Sylvester, David Blaauw, IEEE International Solid-State Circuits Conference (ISSCC), Invited Paper to the IEEE Journal of Solid-State Circuits, 2/1/2017

• Subthreshold Voltage Reference With Nwell/Psub Diode Leakage Compensation for Low-Power High-Temperature Systems, Inhee Lee, Dennis Sylvester, David Blaauw, IEEE Asian Solid-State Circuits Conference, 11/1/2017

• RF-Echo: A Non-Line-of-Sight Indoor Localization System Using a Low-Power Active RF Reflector ASIC Tag, Li-Xuan Chuo, Zhihong Luo, Dennis Sylvester, David Blaauw, Hun-Seok Kim, International Conference on Mobile Computing and Networking, 10/1/2017

• A 1.02nW PMOS-Only, Trim-Free Current Reference with 282ppm/°C from -40°C to 120°C and 1.6% within-Wafer Inaccuracy, Qing Dong, Inhee Lee, Kaiyuan Yang, David Blaauw, Dennis Sylvester, IEEE European Solid-State Circuits Conference, 9/1/2017

• A 1.7nW PLL-Assisted Current Injected 32KHz Crystal Oscillator for IoT, Yu Zeng, Taekwang Jang, Qing Dong, Mehdi Saligane, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, Taiji Ema, Makoto Yasunda, Kazuyuki Kumenoh, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017

• An ultra-wide program, 122pJ/bit flash memory using charge recycling, Supreet Jeloka, Jeongsup Lee, Ziyun Li, Jinal Shah, Qing Dong, Kaiyuan Yang, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017

• A sequence dependent challenge-response PUF using 28nm SRAM 6T bit cell, Supreet Jeloka, Kaiyuan Yang, Michael Orshansky, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 42nJ/conversion On-Demand State-of-Charge Indicator for Miniature IoT Li-ion Batteries, Junwon Jeong, Seokhyeon Jeong, Chulwoo Kim, Dennis Sylvester, David Blaauw, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 0.3V VDDmin 4+2T SRAM for Searching and In-Memory Computing Using 55nm DDC Technology, Qing Dong, Supreet Jeloka, Mehdi Saligane, Yejoong Kim, Masaru Kawaminami, Akihiko Harada, Satoru Miyoshi, David Blaauw, Dennis Sylvester, IEEE Symposium on VLSI Circuits (VLSI-Symp), Invited Paper to the IEEE Journal of Solid States Circuits, 6/1/2017
• Recryptor: A Reconfigurable In-Memory Cryptographic Cortex-M0 Processor for IoT, Yiqun Zhang, Li Xu, Jingcheng Wang, Kaiyuan Yang, Qing Dong, Supreet Jeloka, David Blaauw, Dennis Sylvester, IEEE Symposium on VLSI Circuits (VLSI-Symp), Invited Paper to the IEEE Journal of Solid States Circuits, 6/1/2017
• A 4.7µW Switched-Bias MEMS Microphone Preamplifier for Ultra-Low-Power Voice Interfaces, Sechang Oh, Taekwang Jang, Kyojin D. Choo, David Blaauw, Dennis Sylvester, IEEE Symposium on VLSI Circuits, 6/1/2017
• A 6×5×4mm3 General Purpose Audio Sensor Node with a 4.7µW Audio Processing IC, Minchang Cho, Sechang Oh, Seokhyeon Jeong, Yiqun Zhang, Inhee Lee, Yejoong Kim, Li-Xuan Chuo, Dongkwun Kim, Qing Dong, Yen-Po Chen, Martin Lim, Mike Daneman, David Blaauw, Dennis Sylvester, Hun-Seok Kim, IEEE Symposium on VLSI Circuits, 6/1/2017
• Rectified-linear and Recurrent Neural Networks Built with Spin Devices, Qing Dong, Kaiyuan Yang, Laura Fick, David Blaauw, Dennis Sylvester, IEEE International Symposium on Circuits and Systems, 5/1/2017
• A 1920×1080 30fps 2.3TOPS/W Stereo-Depth Processor for Robust Autonomous Navigation, Ziyun Li, Qing Dong, Mehdi Saligane, Benjamin Kempke, Shijia Yang, Zhengya Zhang, Ronald Dreslinski, Dennis Sylvester, David Blaauw, Hun Seok Kim, IEEE International Solid-State Circuits Conference (ISSCC), Invited Paper to the IEEE Journal of Solid-State Circuits (JSSC), Special Issue on ISSCC, 2/1/2017
• A 0.6nJ -0.22/+0.19°C Inaccuracy Temperature Sensor Using Exponential Subthreshold Oscillation Dependence, Kaiyuan Yang, Qing Dong, Wanyeong Jung, Yiqun Zhang, Myungjoon Choi, David Blaauw, Dennis Sylvester, IEEE International Solid-State Circuits Conference, 2/1/2017
• A 553F2 2-Transistor Amplifier-Based Physically Unclonable Function (PUF) with 1.67% Native Instability, Kaiyuan Yang, Qing Dong, David Blaauw, Dennis Sylvester, IEEE International Solid-State Circuits Conference, 2/1/2017
• A 380pW Dual Mode Optical Wake-up Receiver with Ambient Noise Cancellation, Wooteak Lim, Taekwang Jang, Inhee Lee, Hun-Seok Kim, Dennis Sylvester, David Blaauw, IEEE International Solid-State Circuits Conference, 2/1/2017
• A 1Mb Embedded NOR Flash Memory with 39µW Program Power for mm-Scale High-Temperature Sensor Nodes, Qing Dong, Yejoong Kim, Inhee Lee, Myungjoon Choi, Ziyun Li, Jingcheng Wang, Kaiyuan Yang, Yen-Po Chen, Junjie Dong, Minchang Cho, Gyouho Kim, Wei-Keng Chang, Yun-Sheng Chen, Yu-Der Chih, David Blaauw, Dennis Sylvester, IEEE International Solid-State Circuits Conference, 2/1/2017
• A Fully Integrated Counter Flow Energy Reservoir for 70% Efficient Peak-Power Delivery in Ultra-Low-Power Systems, Xiao Wu, Kyojin Choo, Yao Shi, Li-Xuan Chuo, Dennis Sylvester, David Blaauw, Invited Paper to the IEEE Journal of Solid-State Circuits (JSSC), Special Issue on ISSCC, 2/1/2017
• A 2.5ps 0.8-to-3.2GHz Bang-Bang Phase- and Frequency-Detector-Based All-Digital PLL with Noise Self-Adjustment, Taekwang Jang, Soekhyeon Jeong, Dongsuk Jeon, Kyojin Choo, Dennis Sylvester, David Blaauw, IEEE International Solid-State Circuits Conference (ISSCC), Invited Paper to the IEEE Journal of Solid-State Circuits, 2/1/2017

**Patents Issued**

- Electrostatic discharge clamp circuit for ultra-low power applications, Patent #: 9716381
- Floating-gate transistor array for performing weighted sum computation, Patent #: 9760533
- Ultra Low Power Temperature Insensitive Current Source with Line and Load Regulation, Patent #: 9639107
- Protocol for an electronic device to receive a data packet from an external device, Patent #: 9635147
- Measurement circuitry and method for measuring a clock node to output node delay of a flip-flop, Patent #: 9638752

**Students Advised**

- Ashwin Bhat, ECE PHD (admitted 2018)
- Li-Xuan Chuo, ECE PHD (admitted 2014)
- Zhen Feng, ECE PHD (admitted 2017)
- Ziyun Li, ECE PHD (admitted 2014)
- Rohit Rothe, ECE PHD (admitted 2017)
- Jihwan Seol, ECE PHD (co-advised) (admitted 2017)
- Zhehong Wang, ECE PHD (admitted 2016)
- Xiao Wu, ECE PHD (admitted 2016)
Corso, Jason

Website: http://web.eecs.umich.edu/~jjcorso/

Research Interests: Computer vision, robotics, artificial intelligence.

Recent Publications

- Learning Compositional Sparse Bimodal Models, Kumar S., Dhiman V., Koch P., Corso J., IEEE Transactions on Pattern Analysis and Machine Intelligence, 05/01/2018
- Active Clustering with Model-Based Uncertainty Reduction, Xiong C., Johnson D., Corso J., IEEE Transactions on Pattern Analysis and Machine Intelligence, 1/1/2017
- Dancelets Mining for Video Recommendation Based on Dance Styles, Han T., Yao H., Xu C., Sun X., Zhang Y., Corso J., IEEE Transactions on Multimedia, 4/1/2017
- Editorial for special section of video analytics with deep learning, Mei T., Corso J., Luo J., Pattern Recognition, 8/1/2017

Students Advised

- Shurjo Banerjee, ECE PHD (admitted 2015)
- Vikas Dhiman, ECE PHD (admitted 2014)
- Mohamed Elbanani, CSE PHD
- Victoria Florence, ROB PHD
- Eric Hofesmann, CSE PHD
- Parker Koch, ECE PHD (admitted 2015)
• Stephan Lemmer, ROB PHD
• Nathan Louis, ECE PHD (admitted 2017)
• Byungsu Min, ECE PHD (admitted 2018)
• Sajan Patel, ROB PHD
• Madan Ravi Ganesh, ECE PHD (admitted 2016)
• Ryan Szeto, CSE PHD
• Luowei Zhou, ROB PHD
Deotare, Parag

Website: https://optoexcitonics.engin.umich.edu/

Research Interests: Research includes light-matter interaction in nanoscale systems and the development of low energy photonic and excitonic devices for applications in data communication and life sciences.

Recent Publications

- Efficient Energy Transfer across Organic-2D Inorganic Heterointerfaces, Cheng C., Li Z., Hambarde A., Deotare P., ACS Applied Materials and Interfaces, 10 (45), 2018, pp 39336–39342
- Exciton Transport in Strained Monolayer WSe$_2$, Cordovilla D. F., Li Z., Deotare P. B., MRS Fall 2018
- Highly efficient energy transfer between TMDCs and organic materials, Cheng C., Li Z., Deotare P., 2018 Conference on Lasers and Electro-Optics, CLEO 2018
- Exciton Transport in MoS$_2$/WSe$_2$ Heterostructure, Li Z., Cheng C., Deotare P. B. MRS Spring 2018

Students Advised

- Che-Hsuan Cheng, Material’s Science and Eng PHD
- Kanak Datta, ECE PHD (admitted 2016)
- Zidong Li, ECE PHD (admitted 2017)
Dick, Robert

Website: http://robertdick.org/

Research Interests: Embedded systems.

Recent Publications


Students Advised

- Leonard Blado, ECE PHD (admitted 2017)
- Benjamin Simpson, ECE PHD (admitted 2017)
- Tony Zhang, ECE PHD (admitted 2017)
Fessler, Jeffrey A.

Website: http://web.eecs.umich.edu/~fessler/

Research Interests: Statistical signal and image processing; Tomographic imaging; Parameter estimation; machine-learning methods for inverse problems.

Recent Publications

- Learning dictionary-based unions of subspaces for image denoising, Hong D., Malinas R., Fessler J., Balzano L., European Signal Processing Conference, 11/29/2018
- Asymptotic performance of PCA for high-dimensional heteroscedastic data, Hong D., Balzano L., Fessler J., Journal of Multivariate Analysis, 09/01/2018
- Accelerated methods for low-rank plus sparse image reconstruction, Lin C., Fessler J., Proceedings - International Symposium on Biomedical Imaging, 05/23/2018
- Design of spectral-spatial phase prewinding pulses and their use in small-tip fast recovery steady-state imaging, Williams S., Nielsen J., Fessler J., Noll D., Magnetic Resonance in Medicine, 03/01/2018
- Fast Spatial Resolution Analysis of Quadratic Penalized Least-Squares Image Reconstruction with Separate Real and Imaginary Roughness Penalty: Application to fMRI, Olafsson V., Noll D., Fessler J., IEEE Transactions on Medical Imaging, 02/01/2018
• Optimizing MR scan design for model-based $T_1$, $T_2$ estimation from steady-state sequences, Nataraj G., Nielsen J., Fessler J., IEEE Transactions on Medical Imaging, 2/1/2017
• Sum of outer products dictionary learning for inverse problems, Ravishankar S., Nadakuditi R., Fessler J., 2016 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2016 - Proceedings, 4/19/2017

**Patents Issued**

• Systems and methods for parallel processing of imaging information, Evgeny Drapkin, Jean-Baptiste Thibault, Debashish Pal, Somesh Srivastava Ryan Thome, Madison McGaffin, J A Fessler, Donghwan Kim Patent #: 9721361

**Students Advised**

• Cameron Blocker, ECE PHD; Comput Discovery & Engin Cert. (admitted 2016)
• Caroline Crockett, ECE PHD; EER Cert. (co-advised) (admitted 2017)
• Mingjie Gao, ECE PHD (admitted 2018)
• Shouchang Guo, ECE PHD (admitted 2018)
• David Hong, ECE PHD (co-advised)
• Michelle Karker, BIO PHD
• Anish Lahiri, ECE PHD (admitted 2017)
• Hongki Lim, ECE PHD (admitted 2017)
• Naveen Murthy, ECE PHD (admitted 2017)
• Steven Whitaker, ECE PHD (admitted 2017)
Finelli, Cynthia

Website: https://finelli.engin.umich.edu/

Research Interests: Engineering education research: active learning, evidence-based teaching, student learning, classroom spaces, institutional change, with current projects studying: Motivators and barriers to adoption of active learning; Student resistance to active learning; The impact of classroom space on teaching and learning; Use of technology to increase learning and engagement; The role of background characteristics and socialization experiences in college on co-curricular participation.

Recent Publications

- Integrating quantitative and qualitative research methods to examine student resistance to active learning, Shekhar, P., Prince, M. J., Finelli, C. J., DeMonbrun, R. M., & Waters, C. K. *European Journal of Engineering Education, 44*(1), 6-18, 2019
• Development of a taxonomy of keywords for engineering education research, Finelli, C. J., Borrego, M., & Rasoulifar, G., Joint publication appearing simultaneously in five journals:

**Students Advised**

• Emma Brennan-Wydra, School of Information MS (admitted 2017)
• Laura Carroll, Engineering Education Research PHD (admitted 2018)
• Caroline Crockett, ECE PHD (co-advised) (admitted 2017)
• Trevion Henderson, Education PHD (admitted 2017)
• Rachel Vitali, Mechanical Engineering PHD (co-advised) (admitted 2015)
Flynn, Michael P.

Website: https://www.mpflynngroup.com/

Research Interests: Analog circuits, analog-to-digital conversion, RF and wireless circuits. high-speed serial transceivers.

Recent Publications

- A Maximum-Likelihood Sequence Detection Powered ADC-Based Serial Link, Song S., Choo K., Chen T., Jang S., Flynn M., Zhang Z., IEEE Transactions on Circuits and Systems I: Regular Papers, 07/01/2018
- A SGS/s 156MHz BW 70dB DR continuous-time sigma-delta modulator with time-interleaved reference data-weighted averaging, Dayanik M., Weyer D., Flynn M., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017
• A calibration-free 2.3 mW 73.2 dB SNDR 15b 100 MS/s four-stage fully differential ring amplifier based SAR-assisted pipeline ADC, Lim Y., Flynn M., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017
• A Maximum-Likelihood Sequence Detection Powered ADC-Based Serial Link, Song S., Choo K., Chen T., Jang S., Flynn M., Zhang Z., IEEE Transactions on Circuits and Systems I: Regular Papers, 12/7/2017
• New Associate Editors, Flynn M., IEEE Journal of Solid-State Circuits, 1/1/2017

**Patents Issued**


**Students Advised**

• John Bell, ECE PHD (admitted 2016)
• Peter Brown, ECE PHD (admitted 2015)
• Fred Buhler, ECE PHD (admitted 2014)
• Justin Correll, ECE PHD (admitted 2016)
• Linda Gong, ECE PHD (admitted 2018)
• Lu Jie, ECE PHD (admitted 2017)
• Taewook Kang, ECE PHD (admitted 2016)
• Seungjong Lee, ECE PHD (admitted 2017)
• Rundao Lu, ECE PHD (admitted 2016)
• Christine Weston, ECE PHD (co-advised) (admitted 2017)
• Boyi Zheng, ECE PHD (admitted 2016)
Forrest, Stephen R.

Website: http://www.umich.edu/~ocm/


Recent Publications

- Continuous Roll-to-Roll Fabrication of Organic Photovoltaic Cells via Interconnected High-Vacuum and Low-Pressure Organic Vapor Phase Deposition Systems, Qu B., Forrest S.R., Applied Physics Letters, 113 (5) 053302, 07/30/2018
- Efficient Outcoupling of Organic Light-Emitting Devices Using a Light-Scattering Dielectric Layer, Kim J., Qu Y., Coburn C., Forrest S.R., ACS Photonics 5 (8), 3315-21, 07/02/2018
- Thin-Film Architectures with High Spectral Selectivity for Thermophotovoltaic Cells, Burger T., Fan D., Lee K., Forrest S.R., Lenert A., ACS Photonics, 5, 2748-54, 06/27/2018
- High Fabrication Yield Organic Tandem Photovoltaics Combining Vacuum- and Solution-Processed Subcells with 15% Efficiency, Che X., Li Y., Qu Y., Forrest S., Nature Energy, 05/01/2018
- High Fabrication Yield Organic Tandem Photovoltaics Combining Vacuum- and Solution-Processed Subcells with 15% Efficiency, Che X., Li Y., Qu Y., Forrest S.R., Nat. Energy, 3, 422-7, 04/23/2018
• Efficient, Nonintrusive Outcoupling in Organic Light Emitting Devices Using Embedded Microlens Arrays, Qu Y., Kim J., Coburn C., Forrest S.R., ACS Photonics, 5 (6) 2453-8, 04/17/2018
• Reliable, All-Phosphorescent Stacked White Organic Light Emitting Devices with a High Color Rendering Index, Coburn C., Jeong C., Forrest S., ACS Photonics, 02/21/2018
• Centimetre-scale electron diffusion in photoactive organic heterostructures, Burlingame Q., Coburn C., Che X., Panda A., Qu Y., Forrest S., Nature, 554, 77, 02/01/2018
• Engineering Temperature-Dependent Carrier Concentration in Bulk Composite Materials via Temperature-Dependent Fermi Level Offset, Hui S., Gao W., Lu X., Panda A., Bailey T., Page A., Forrest S., Morelli D., Pan X., Pipe K., Uher C., Advanced Energy Materials, 01/25/2018
• Dipole-Aligned Energy Transfer between Excitons in Two-Dimensional Transition Metal Dichalcogenide and Organic Semiconductor, Gu J., Liu X., Lin E., Lee Y., Forrest S., Menon V., ACS Photonics, 01/17/2018
• Quantum Confinement of Hybrid Charge Transfer Excitons in GaN/InGaN/Organic Semiconductor Quantum Wells, Panda A., Forrest S., Nano Letters, 17, 7853, 12/13/2017
• Reliable, all-phosphorescent stacked white organic light emitting devices with a high color rendering index, Coburn C., Jeong C., Forrest S., ACS Photonics, 10/13/2017
• Hot excited state management for long-lived blue phosphorescent organic light-emitting diodes, Lee J., Jeong C., Batagoda T., Coburn C., Thompson M., Forrest S., Nature Communications, 8, 05/31/2017
• Photoresponse of an Organic Semiconductor/Two-Dimensional Transition Metal Dichalcogenide Heterojunction, Liu X., Gu J., Ding K., Fan D., Hu X., Tseng Y., Lee Y., Menon V., Forrest S., Nano Letters, 05/10/2017
• Effects of Charge Balance and Exciton Confinement on the Operational Lifetime of Blue Phosphorescent Organic Light-Emitting Diodes, Coburn C., Forrest S., Physical Review Applied, 7, 41002, 04/24/2017
• Elimination of Plasmon Losses and Enhanced Light Extraction of Top-Emitting Organic Light-Emitting Devices Using a Reflective Subelectrode Grid, Qu Y., Coburn C., Fan D., Forrest S., ACS Photonics, 4 (2) 363-8, 02/15/2017
• Outdoor operation of small-molecule organic photovoltaics, Burlingame Q., Zanotti G., Ciammaruchi L., Katz E., Forrest S., Organic Electronics: physics, materials, applications, 41, 274-9, 02/01/2017

**Patents Issued**

• Thermal Surface Treatment for Reuse of Wafers after Epitaxial Lift Off, Patent #9,548,218
• Optoelectronic device formed with controlled vapor flow, Patent #9,653,709
• Growth of ordered crystalline organic films, Patent #9,666,816
• Extended OLED Operational Lifetime Through Phosphorescent Dopant Profile Management, Patent #9,666,822
• Organic Vapor Jet Print Head with Solder Joint, Patent #9,700,901
• Enhancing light extraction of organic light emitting diodes via nanoscale texturing of electrode surfaces, Patent #9,761,842
• Enhanced bulk heterojunction devices prepared by thermal and solvent vapor annealing processes, Patent #9,768,402
• Patterning by stamped metal resist, Patent #9,793,481
• Nozzle geometry for organic vapor jet printing, Patent #9,797,039
• Use of inverse quasi-epitaxy to modify order during post-deposition processing of organic photovoltaics, Patent #9,847,487
• Electrophosphorescent organic light emitting concentrator, Patent #9,853,247
• Microfluidic device and method using double anodic bonding, Patent #9,873,939
• Excited state management, Patent #9,929,365
• Photovoltaic cells with a graded active region achieved using stamp transfer printing, Patent #9,978,968
• Stacked white OLED having separate red, green and blue sub-elements, Patent #10,014,485
• Devices combining thin film inorganic LEDs with organic LEDs and fabrication thereof, Patent #10,062,738
• Fabrication of photodiode array on spherical platform for 4-Pi detection awareness, Patent #10,032,812
• Thick-ETL OLEDs with sub-ITO grids with improved outcoupling, Patent #10,038,167
• Integration of epitaxial lift-off solar cells with mini-parabolic concentrator arrays via printing method, Patent #10,069,033
• Organic photosensitive devices with exciton-blocking charge carrier filters, Patent #10,069,095
• Organic electroluminescent devices, Patent #10,074,815
• Excitonic energy transfer to increase inorganic solar cell efficiency, Patent #10,074,820
• Epitaxial lift-off processed GaAs thin-film solar cells integrated with non-tracking mini-
  compound parabolic concentrators, Patent #10,141,465
• Hybrid planar-graded heterojunction for organic photovoltaics, Patent #10,141,531
• Thin film lift-off via combination of epitaxial lift-off and spalling, Patent #10,186,629

Students Advised

• Claire Arneson, Physics PHD (admitted 2018)
• Clarence Chan, ECE PHD (admitted 2017)
• Caleb Coburn, Physics PHD (admitted 2013)
• Kan Ding, Physics PHD (admitted 2014)
• Dejiu Fan, ECE PHD (admitted 2013)
• Jeffrey Horowitz, ECE PHD (admitted 2018)
• Xiaheng Huang, ECE PHD (admitted 2018)
• Xinjing Huang, Applied Physics PHD (admitted 2017)
• Jong Chan Kim, ECE PHD (admitted 2016)
• Byungjun Lee, ECE PHD (admitted 2016)
• Boning Qu, MSE PHD (admitted 2016)
• Yue Qu, ECE PHD (admitted 2014)
• Hafiz Sheriff, Applied Physics PHD (admitted 2017)
• Chan Ho Soh, ECE PHD (admitted 2018)
Freudenberg, James S.

Website: https://freudenberg.engin.umich.edu/

Research Interests: Fundamental design limitations in feedback control systems, embedded control systems.

Recent Publications

Galvanauskas, Almantas

Website: https://galvanauskas.engin.umich.edu/

Research Interests: High power ultrafast fiber lasers for nonlinear optics, high intensity laser-matter interactions, laser driven secondary-radiation such as gamma and x-ray sources, and laser acceleration of charged particles. Main emphasis of current research efforts is on developing a new generation of laser-plasma accelerator drivers that could enable high energy and brightness particle accelerators for future fundamental science experiments as well as for new applications in biology, medicine and material science.

Recent Publications

- Mode-locked oscillator phase stabilization using a Gires-Tournois interferometer, Cui Y., Pei H., Nees J., Galvanauskas A., Optics InfoBase Conference Papers, 01/01/2018
- Narrowband transverse-modal-instability (TMI)-free Yb-doped fiber amplifiers for directed energy applications, Kanskar M., Zhang J., Koponen J., Kimmelma O., Aallos V., Hu I., Galvanauskas A., Proceedings of SPIE - The International Society for Optical Engineering, 01/01/2018
- High energy ultrafast fiber lasers based on coherent pulse stacking amplification, Pei H., Whittlesey M., Ruppe J., Sheikhsofla M., Chen S., Nees J., Du Q., Wilcox R., Leemans W., Galvanauskas A., Optics InfoBase Conference Papers, 01/01/2018
- Cavity phase measurement via modulated impulse response for coherent temporal pulse stacking, Yang Y., Dawson J., Doolittle L., Du Q., Galvanauskas A., Huang G., Zhou T., Wilcox R., Leemans W., Optics InfoBase Conference Papers, 01/01/2018
- 10mJ energy extraction from Yb-doped 85mm core CCC fiber using coherent pulse stacking amplification of fs pulses, Pei H., Ruppe J., Chen S., Sheikhsofla M., Nees J., Yang Y., Wilcox R., Leemans W., Galvanauskas A., Optics InfoBase Conference Papers, 1/1/2017
- Coherent pulse stacking amplification - extending chirped pulse amplification by orders of magnitude, Ruppe J., Pei H., Sheikhsofla M., Chen S., Wilcox R., Leemans W., Nees J., Galvanauskas A., Optics InfoBase Conference Papers, 1/1/2017
• Multi-mJ ultrashort pulse coherent pulse stacking amplification in a Yb-doped 85mm CCC fiber based system, Pei H., Ruppe J., Chen S., Sheikhsofla M., Nees J., Galvanauskas A., Optics InfoBase Conference Papers, 1/1/2017
• Summary report of working group 8: Advanced beam and laser facilities and technology, Galvanauskas A., Granados E., AIP Conference Proceedings, 3/6/2017

**Patents Issued**

• Coherent Combining of Pulse Bursts in Time Domain, Almantas Galvanauskas, Patent #: 9865986
• N2 Times Pulse Energy Enhancement Using Coherent Addition of N Orthogonally Phase Modulated Periodic Signals, Almantas Galvanauskas, Patent #: 9503196

**Students Advised**

• Siyun Chen, ECE PHD (admitted 2016)
• Yifan Cui, ECE PHD (admitted 2017)
• Weizhi Du, ECE PHD; Comput Discovery & Engin Cert. (admitted 2017)
• Hanzhang Pei, ECE PHD (admitted 2015)
• Alexander Rainville, ECE PHD (admitted 2017)
• Theodore Whittlesey, ECE PHD (admitted 2017)
Gianchandani, Yogesh B.

Website: https://gianchandani.engin.umich.edu/

Research Interests: Design and fabrication of microsensors, microactuators, and micro-electro-mechanical systems (MEMS) for a variety of applications such as environmental sensing, micro gas chromatographs, gas phase micropumps, microfluidics, microoptics, and biomedical instrumentation; Development of manufacturing processes using combinations of traditional and novel materials and techniques, for example, micro-electro-discharge machining and microplasmas; Design of interface circuits for MEMS and development of co-fabrication techniques for circuits and MEMS.

Recent Publications

- Analysis of Extracellular Vesicles Using Coffee Ring, Jeong H., Han C., Cho S., Gianchandani Y., Park J., ACS Applied Materials and Interfaces, 07/11/2018
- Encapsulation Approaches for In-Stent Wireless Magnetoelastic Sensors, Jiang J., Nambisan R., Green S., Gianchandani Y., IEEE Transactions on Biomedical Engineering, 01/01/2018
- Autonomous microsystems for downhole applications: Design challenges, current state, and initial test results, Choi M., Sui Y., Lee I., Meredith R., Ma Y., Kim G., Blaauw D., Gianchandani Y., Li T., Sensors (Switzerland), 10/1/2017
- Facile batch mode process for high capacity rechargeable nickel-zinc microbatteries, Vellaluru N., Gianchandani Y., Li T., TRANSDUCERS 2017 - 19th International Conference on Solid-State Sensors, Actuators and Microsystems, 7/26/2017
- In situ acoustomagnetic interrogation of a glaucoma valve with integrated wireless microactuator, Nambisan R., Green S., Stein J., Gianchandani Y., TRANSDUCERS 2017 - 19th International Conference on Solid-State Sensors, Actuators and Microsystems, 7/26/2017
• Miniaturized magnet-less RF electron trap. II. Experimental verification, Deng S., Green S., Markosyan A., Kushner M., Gianchandani Y., Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics, 7/1/2017
• Wireless magnetoelastic transducers for biomedical applications, Green S., Gianchandani Y., Proceedings of SPIE - The International Society for Optical Engineering, 1/1/2017

Patents Issued
• Packaged Microsystems, Y.B. Gianchandani, T. Li, and Y. Ma Patent #: 9950922

Students Advised
• Alexander Benken, ECE PHD (admitted 2014)
• Tsenguun Byambadorj, ECE PHD (admitted 2017)
• Qisen Cheng, ME PHD
• Partha Dutta, ECE PHD (admitted 2017)
• Johnathan Lewis, ECE PHD (admitted 2017)
• Weilin Liao, ECE PHD (admitted 2017)
• Hsueh-Tsung Lu, ME PHD
• Ramprasad Mohanan Nambisan, ECE PHD (admitted 2015)
• Andrew Trickey-Glassman, ECE PHD (admitted 2014)
• Needarika Vellaluru, ECE PHD (admitted 2017)
• Xiangyu Zhao, ECE PHD (admitted 2018)
Gilchrist, Brian E.

Website: http://web.eecs.umich.edu/faculty/gilchrist/

Research Interests: Plasma electrodynamics and diagnostics; Wireless Technology; Space Systems & Technology.

Recent Publications

- Investigating miniaturized electrodynamic tethers for picosatellites and femtosatellites, Bell I., Gilchrist B., McTernan J., Bilen S., Journal of Spacecraft and Rockets, 1/1/2017

Students Advised

- Grant Miars, ECE PHD, Plasma Science & Engin Cert (admitted 2014)
Grbic, Anthony

**Website:** https://grbic.engin.umich.edu/

**Research Interests:** Engineered electromagnetic structures (metamaterials, metasurfaces, electromagnetic band-gap materials, frequency selective surfaces), antennas, near-field radiation and localized waves, microwave circuits, plasmonics, optics, wireless power transmission systems, and analytical modeling in electromagnetics/optics.

**Recent Publications**


**Patents Issued**

• Wireless Power Transfer Using Multiple Near-Field Plates, Anthony Grbic and Steve Young, Patent #: US9793720B2

**Students Advised**

• Faris Alsolamy, ECE PHD (admitted 2015)
• Brian Raeker, ECE PHD (admitted 2016)
• Mohammadamin Ranjbaraskari, ECE PHD (admitted 2014)
• Francis Salas, ECE PHD (admitted 2016)
• Cody Scarborough, ECE PHD (admitted 2017)
• Luke Szymanski, ECE PHD (admitted 2016)
• Zhanni Wu, ECE PHD (admitted 2015)
Grizzle, Jessy W.

Website: http://web.eecs.umich.edu/faculty/grizzle/

Research Interests: Analysis and feedback control of nonlinear systems; Control of bipedal robot locomotion.

Recent Publications

- Correctness Guarantees for the Composition of Lane Keeping and Adaptive Cruise Control, Xu X., Grizzle J., Tabuada P., Ames A., IEEE Transactions on Automation Science and Engineering, 07/01/2018
- Self-synchronization and self-stabilization of 3D bipedal walking gaits, Chevallereau C., Razavi H., Six D., Aoustin Y., Grizzle J., Robotics and Autonomous Systems, 02/01/2018
- Hybrid electric powertrain design methodology with planetary gear sets for performance and fuel economy, Dagci O., Peng H., Grizzle J., IEEE Access, 01/23/2018
- Validating Noncooperative Control Designs Through a Lyapunov Approach, Chen Y., Peng H., Grizzle J., IEEE Transactions on Control Systems Technology, 01/05/2018
- Obstacle Avoidance for Low-Speed Autonomous Vehicles With Barrier Function, Chen Y., Peng H., Grizzle J., IEEE Transactions on Control Systems Technology, 01/01/2018
- Correct by construction design of autonomous vehicles through a barrier function method, Chen Y., Peng H., Grizzle J., Proceedings of the American Control Conference, 6/29/2017
• Fast Trajectory Planning and Robust Trajectory Tracking for Pedestrian Avoidance, Chen Y., Peng H., Grizzle J., IEEE Access, 1/1/2017
• First steps toward formal controller synthesis for bipedal robots with experimental implementation, Ames A., Tabuada P., Jones A., Ma W., Rungger M., Schurmann B., Kolathaya S., Grizzle J., Nonlinear Analysis: Hybrid Systems, 8/1/2017
• Nonholonomic virtual constraints and gait optimization for robust walking control, Griffin B., Grizzle J., International Journal of Robotics Research, 7/1/2017
• Obstacle Avoidance for Low-Speed Autonomous Vehicles With Barrier Function, Chen Y., Peng H., Grizzle J., IEEE Transactions on Control Systems Technology, 1/1/2018
• Reduced-order framework for exponential stabilization of periodic orbits on parameterized hybrid zero dynamics manifolds: Application to bipedal locomotion, Akbari Hamed K., Grizzle J., Nonlinear Analysis: Hybrid Systems, 8/1/2017
• Supervised learning for stabilizing underactuated bipedal robot locomotion, with outdoor experiments on the wave field, Da X., Hartley R., Grizzle J., Proceedings - IEEE International Conference on Robotics and Automation, 7/21/2017

Students Advised

• Grant Gibson, ROB PHD
• Yukai Gong, ROB PHD
• Omar Harib, ECE PHD; ME Master's (admitted 2016)
• Matthew Hartley, ROB PHD
• Bruce Huang, ROB PHD
• Margaret Eva Mungai, ME PHD
Guo, L. Jay

Website: http://www.guogroup.org/

Research Interests: Polymer-based photonic sensors and photoacoustics, organic and hybrid photovoltaics, flexible transparent conductors, plasmonic nanophotonics & structural colors, nanomanufacturing technologies and applications.

Recent Publications

- Efficient Photoacoustic Conversion in Optical Nanomaterials and Composites, Lee T., Baac H., Li Q., Guo L., Advanced Optical Materials, 12/17/2018
- Planar Metasurfaces Enable High-Efficiency Colored Perovskite Solar Cells, Liu D., Wang L., Cui Q., Guo L., Advanced Science, 10/01/2018
- Robust Extraction of Hyperbolic Metamaterial Permittivity Using Total Internal Reflection Ellipsometry, Zhang C., Hong N., Ji C., Zhu W., Chen X., Agrawal A., Zhang Z., Tiwald T., Schoeche S., Hilfiker J., Guo L., Lezec H., ACS Photonics, 06/20/2018
- Demonstration of versatile whispering-gallery micro-lasers for remote refractive index sensing, Wan L., Chandrahalim H., Zhou J., Li Z., Chen C., Cho S., Zhang H., Mei T., Tian H., Oki Y., Nishimura N., Fan X., Jay Guo L., Optics Express, 03/05/2018
- Achieving pattern uniformity in plasmonic lithography by spatial frequency selection, Liang G., Chen X., Zhao Q., Guo L., Nanophotonics, 01/01/2018
- RGB tunable color filters using germanium telluride, Jafari M., Guo L., Rais-Zadeh M., Proceedings of SPIE - The International Society for Optical Engineering, 01/01/2018
- Decorative near-infrared transmission filters featuring high-efficiency and angular-insensitivity employing 1D photonic crystals, Ji C., Yang C., Shen W., Lee K., Zhang Y., Liu X., Guo L., Nano Research, 01/01/2018
• Controlled synthesis of brightly fluorescent CH$_3$NH$_3$PbBr$_3$ perovskite nanocrystals employing Pb(C$_{17}$H$_{33}$COO)$_2$ as the sole lead source, Fu X., Peng Z., Zhang C., Xia Y., Zhang J., Luo W., Guo L., Li H., Wang Y., Zhang D., RSC Advances, 01/01/2018
• Sustainable p-type copper selenide solar material with ultra-large absorption coefficient, Chen E., Williams L., Olvera A., Zhang C., Zhang M., Shi G., Heron J., Qi L., Guo L., Kioupakis E., Poudeu P., Chemical Science, 01/01/2018
• 5-nm LiF as an Efficient Cathode Buffer Layer in Polymer Solar Cells Through Simply Introducing a C 60 Interlayer, Liu X., Guo L., Zheng Y., Nanoscale Research Letters, 1/1/2017
• Abnormal Multiple Charge Memory States in Exfoliated Few-Layer WSe 2 Transistors, Chen M., Wang Y., Shepherd N., Huard C., Zhou J., Guo L., Lu W., Liang X., ACS Nano, 1/24/2017
• Achieving pattern uniformity in plasmonic lithography by spatial frequency selection, Liang G., Chen X., Zhao Q., Guo L., Nanophotonics, 1/1/2018
• An ultra-fast optical shutter exploiting total light absorption in a phase change material, Jafari M., Guo L., Rais-Zadeh M., Proceedings of SPIE - The International Society for Optical Engineering, 1/1/2017
• Engineering Light at the Nanoscale: Structural Color Filters and Broadband Perfect Absorbers, Ji C., Lee K., Xu T., Zhou J., Park H., Guo L., Advanced Optical Materials, 10/16/2017
• Fabrication of contact lens containing high-performance wire grid polarizer, Shin Y., Shin M., Guo L., Shin J., Polymer International, 9/1/2017
• Half-mode hexagonal substrate integrated waveguide (HMHSIW) structure and its application, Jang T., Payne K., Guo L., Choi J., IEEE MTT-S International Microwave Symposium Digest, 10/4/2017
• Highly Efficient Photoacoustic Conversion by Facilitated Heat Transfer in Ultrathin Metal Film Sandwiched by Polymer Layers, Lee T., Guo L., Advanced Optical Materials, 1/18/2017
• Improving the Radiative Efficiency of InGaN Quantum Dots via an Open Top Cavity, Demory B., Katcher A., Hill T., Teng C., Zhang C., Guo L., Deng H., Ku P., ACS Photonics, 4/19/2017
• Laser-generated focused ultrasound for micro-cavitation and its application to high-precision cavitation treatment, Lee T., Luo W., Li Q., Dernirci H., Guo L., IEEE International Ultrasonics Symposium, IUS, 10/31/2017
• Laser-Induced Focused Ultrasound for Cavitation Treatment: Toward High-Precision Invisible Sonic Scalpel, Lee T., Luo W., Li Q., Demirici H., Guo L., Small, 10/11/2017
• Nanofluidic/nanoelectronic study on solvent-processed nanoscale organic transistors, Li D., Ryu B., Cui Q., Chen M., Jay Guo L., Ma B., Liang X., Journal of Vacuum Science and Technology B: Nanotechnology and Microelectronics, 11/1/2017
• Performance analyses of plasmonic lithography, Chen X., Liang G., Guo L., Proceedings of SPIE - The International Society for Optical Engineering, 1/1/2017
• Plasmonic Lithography Utilizing Epsilon Near Zero Hyperbolic Metamaterial, Chen X., Zhang C., Yang F., Liang G., Li Q., Guo L., ACS Nano, 10/24/2017
• Printed large-area flat optical component: Metasurfaces for cylindrical vector beam generation, Zhang C., Li Q., Jin L., Chen X., Jay Guo L., Optics InfoBase Conference Papers, 1/1/2017
• Semitransparent and flexible mechanically reconfigurable electrically small antennas based on tortuous metallic micromesh, Jang T., Zhang C., Youn H., Zhou J., Guo L., IEEE Transactions on Antennas and Propagation, 1/1/2017
• Wavelength scale terahertz spectrometer based on extraordinary transmission, Henstridge M., Zhou J., Jay Guo L., Merlin R., Applied Physics Letters, 8/7/2017

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**Patents Issued**

- Real time detection and imaging of THz pulse radiation by using photoacoustic conversions, L. J. Guo Patent #: 9795689
- Dye and pigment-free structural colors and angle-insensitive spectrum filters, L. J. Guo, A. E. Hollowell, Y.-K. Wu Patent #: 9547107
- Methods and Devices For Generating High-Amplitude And High-Frequency Focused Ultrasound With Light Absorbing Materials, L. J. Guo, H. W. Baac Patent #: 9601103

**Students Advised**

- Qingyu Cui, ECE PHD (admitted 2014)
- Weijie Feng, MACRO PHD (admitted 2018)
- Mohsen Jafari, ECE PHD (admitted 2014, co-advisor)
- Changyeong Jeong, ECE PHD (admitted 2015)
- Suneel Joglekar, ECE PHD (admitted 2015)
- Sang Hyun Lee, ECE PHD (admitted 2018)
- Maxwell Li, ECE PHD (admitted 2015, co-advisor)
- Jihun Lim, ECE PHD (admitted 2017)
- Sunghyun Nam, MACRO PHD (admitted 2015)
- Yongbum Park, ECE PHD (admitted 2015)
- Kaito Yamada, Applied Physics PHD (admitted 2016)
- Yichun Zhang, MACRO PHD (admitted 2018)
Hero, Alfred O.

Website: https://hero.engin.umich.edu/


Recent Publications

- Accelerated Distributed Dual Averaging over Evolving Networks of Growing Connectivity, Liu S., Chen P., Hero A., IEEE Transactions on Signal Processing, 04/01/2018
- Semiblind subgraph reconstruction in Gaussian graphical models, Xie T., Liu S., Hero A., 2017 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2017 - Proceedings, 03/07/2018
- Unequal error protection querying policies for the noisy 20 questions problem, Chung H., Sadler B., Zheng L., Hero A., IEEE Transactions on Information Theory, 02/01/2018
- Direct estimation of density functionals using a polynomial basis, Wisler A., Berisha V., Spanias A., Hero A., IEEE Transactions on Signal Processing, 02/01/2018
• Bounds on variance for unimodal distributions, Chung H., Sadler B., Hero A., IEEE Transactions on Information Theory, 11/1/2017
• Distributed optimization for evolving networks of growing connectivity, Liu S., Chen P., Hero A., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 6/16/2017
• Distributed sensor selection for field estimation, Liu S., Chepuri S., Leus G., Hero A., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 6/16/2017
• Dynamic reconstruction of influence graphs with adaptive directed information, Oselio B., Hero A., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 6/16/2017
• Ensemble estimation of mutual information, Moon K., Sricharan K., Hero A., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
• Information theoretic structure learning with confidence, Moon K., Noshad M., Sekeh S., Hero A., ICASSP, IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings, 6/16/2017
• Nasopharyngeal Protein Biomarkers of Acute Respiratory Virus Infection, Burke T., Henao R., Soderblom E., Tsalik E., Thompson J., McClain M., Nichols M., Nicholson B.,
• Quickest hub discovery in correlation graphs, Banerjee T., Hero A., Conference Record - Asilomar Conference on Signals, Systems and Computers, 3/1/2017
• The three-terminal interactive lossy source coding problem, Vega L., Piantanida P., Hero A., IEEE Transactions on Information Theory, 1/1/2017
• Two-stage sampling, prediction and adaptive regression via correlation screening, Firouzi H., Hero A., Rajaratnam B., IEEE Transactions on Information Theory, 1/1/2017

Recent patents Issued

Students Currently Advised
• Neophytos Charalambides, ECE PHD (admitted 2017)
• Elizabeth Hou, ECE PHD (admitted 2017)
• Joel Leblanc, ECE PHD (admitted 2007)
• Robert Malinas, ECE PHD (admitted 2018)
• Mortaza Noushad Iranzad, CSE PHD
• Brandon Oselio, ECE PHD, Statistics Master's (admitted 2012)
• Haonan Zhu, ECE PHD (admitted 2018)
• Yaya Zhai, Bioinformatics PHD (admitted 2014)
• Yun Wei, Applied Math PHD (admitted 2013)
• Byoung Jan, Statistics PHD (admitted 2015)
Hiskens, Ian A.

Website: https://web.eecs.umich.edu/~hiskens/

Research Interests: Power system analysis, Analysis and control of nonlinear non-smooth dynamical systems. Areas of specialty: Power system dynamics and control, Wind power, Grid controllability, Inverse problems.

Recent Publications

- Consensus-based coordination of electric vehicle charging considering transformer hierarchy, Zou S., Hiskens I., Ma Z., Control Engineering Practice, 11/01/2018
- A Dynamical Systems Approach to Modeling and Analysis of Transactive Energy Coordination, Nazir M., Hiskens I., IEEE Transactions on Power Systems, 05/10/2018
- Load synchronization and sustained oscillations induced by transactive control, Nazir M., Hiskens I., IEEE Power and Energy Society General Meeting, 01/29/2018
- Optimal control policies for reserve deployment with probabilistic performance guarantees, Vrakopoulou M., Hiskens I., 2017 IEEE 56th Annual Conference on Decision and Control, CDC 2017, 01/18/2018
- Parametric dependence of large disturbance response and relationship to stability boundary, Fisher M., Hiskens I., 2017 IEEE 56th Annual Conference on Decision and Control, CDC 2017, 01/18/2018
- Consensus-Based Coordination of Electric Vehicle Charging, Zou S., Hiskens I., Ma Z., Liu X., IFAC-PapersOnLine, 7/1/2017
- Decentralized Coordination of Controlled Loads and Transformers in a hierarchical structure, Zou S., Hiskens I., Ma Z., IFAC-PapersOnLine, 7/1/2017
- Moment relaxations of optimal power flow problems: Beyond the convex hull, Molzahn D., Josz C., Hiskens I., 2016 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2016 - Proceedings, 4/19/2017
- Noise and Parameter Heterogeneity in Aggregate Models of Thermostatically Controlled Loads, Nazir M., Hiskens I., IFAC-PapersOnLine, 7/1/2017
- Performance Limits of Thermostatically Controlled Loads under Probabilistic Switching, Nazir M., Ross S., Mathieu J., Hiskens I., IFAC-PapersOnLine, 7/1/2017

Students Advised
- Michael Fisher, ECE PHD (admitted 2014)
- Sijia Geng, ECE PHD (admitted 2016)
- Jonas Kersulis, ECE PHD (admitted 2013)
- Md Nazir, ECE PHD (admitted 2015)
Hofmann, Heath

Website: https://hofmann.engin.umich.edu/

Research Interests: Power electronics and systems.

Recent Publications

- Parameter identification of lithium-ion battery pack for different applications based on Cramer-Rao bound analysis and experimental study, Song Z., Hofmann H., Lin X., Han X., Hou J., Applied Energy, 12/01/2018
- Simultaneous Identification and Torque Control of Surface-Mount Permanent Magnet Synchronous Machines with Inverter Current and Voltage Constraints, Delgado F., Reed D., Hofmann H., Sun J., 2018 IEEE Conference on Control Technology and Applications, CCTA 2018, 10/26/2018
- Robust, Accurate Systems-based Power Electronic Circuit Models in Simulink, Song H., Hofmann H., 2018 IEEE 19th Workshop on Control and Modeling for Power Electronics, COMPEL 2018, 09/10/2018
- A Dual-Coupled LCC-Compensated IPT System with a Compact Magnetic Coupler, Lu F., Zhang H., Hofmann H., Su W., Mi C., IEEE Transactions on Power Electronics, 07/01/2018
- The battery-supercapacitor hybrid energy storage system in electric vehicle applications: A case study, Song Z., Li J., Hou J., Hofmann H., Ouyang M., Du J., Energy, 07/01/2018
- Adaptive model predictive control with propulsion load estimation and prediction for all-electric ship energy management, Hou J., Sun J., Hofmann H., Energy, 05/01/2018
- Control development and performance evaluation for battery/flywheel hybrid energy storage solutions to mitigate load fluctuations in all-electric ship propulsion systems, Hou J., Sun J., Hofmann H., Applied Energy, 02/15/2018
• A Double-Sided LC-Compensation Circuit for Loosely Coupled Capacitive Power Transfer, Lu F., Zhang H., Hofmann H., Mi C., IEEE Transactions on Power Electronics, 02/01/2018
• Component sizing optimization of plug-in hybrid electric vehicles with the hybrid energy storage system, Song Z., Zhang X., Li J., Hofmann H., Ouyang M., Du J., Energy, 02/01/2018
• Rotor Resistance Estimation for Induction Machines Using Carrier Signal Injection with Minimized Torque Ripple, Hasanzadeh A., Reed D., Hofmann H., IEEE Transactions on Energy Conversion, 01/01/2018
• Six-Plate Capacitive Coupler to Reduce Electric Field Emission in Large Air-Gap Capacitive Power Transfer, Zhang H., Lu F., Hofmann H., Liu W., Mi C., IEEE Transactions on Power Electronics, 01/01/2018
• A Dual-Coupled LCC-Compensated IPT System with a Compact Magnetic Coupler, Lu F., Zhang H., Hofmann H., Su W., Mi C., IEEE Transactions on Power Electronics, 8/31/2017
• A high efficiency and compact inductive power transfer system compatible with both 3.3kW and 7.7kW receivers, Lu F., Zhang H., Kan T., Hofmann H., Mei Y., Cai L., Mi C., Conference Proceedings - IEEE Applied Power Electronics Conference and Exposition - APEC, 5/17/2017
• An LC-Compensated Electric Field Repeater for Long-Distance Capacitive Power Transfer, Zhang H., Lu F., Hofmann H., Liu W., Mi C., IEEE Transactions on Industry Applications, 9/1/2017
• Autonomous Wideband Piezoelectric Energy Harvesting Utilizing a Resonant Inverter, Stein A., Hofmann H., IEEE Transactions on Power Electronics, 8/1/2017
• Simultaneous Identification and Adaptive Torque Control of Permanent Magnet Synchronous Machines, Reed D., Sun J., Hofmann H., IEEE Transactions on Control Systems Technology, 7/1/2017
• Sliding-mode and Lyapunov function-based control for battery/supercapacitor hybrid energy storage system used in electric vehicles, Song Z., Hou J., Hofmann H., Li J., Ouyang M., Energy, 1/1/2017

**Patents Issued**

• Electromechanical Flywheels, C.M. Kalev, H.F. Hofmann, Patent #: US9673680B2
• Homopolar motor-generators, C. Kalev and H. Hofmann, Patent #: 9548645

**Students Advised**

• Jake Chung, ECE PHD (admitted 2017)
• Daniel Dahl, ECE PHD (admitted 2018)
• Fanny Pinto Delgado, ECE PHD (admitted 2017)
• Yuanying Wang, ECE PHD (admitted 2016)
Islam, Mohammed N.

Website: https://islam.engin.umich.edu/

Research Interests: Mid- and near-infrared laser sources and their applications in defense and healthcare. On the defense side, applications include infrared countermeasures, explosives detection, and active remote sensing. On the healthcare side, his research relates to using fiber lasers in cardiology, dentistry, non-invasive glucose monitoring and blood analyte measurements, and selective ablation of visceral fat for diabetes treatment.

Recent Publications

**Patents Issued**

- Short-Wave Infrared Super-Continuum Lasers for Detecting Counterfeit or Illicit Drugs and Pharmaceutical Process Control, M.N. Islam [OMNI-0105-PUSP1], U.S. Patent # 9,651,533
- Broadband or Mid-Infrared Fiber Light Sources, M.N. Islam [OMNI-0109-PUSP7], U.S. Patent # 9,476,769
- System and Method for Voice Control of Medical Devices, M.N. Islam [OMNI-0110-PUSP11], U.S. Patent # 9,456,751
- Broadband or Mid-Infrared Fiber Light Sources, M.N. Islam [OMNI-0109-PCA], Canadian Patent # 2,623,380
- Near-infrared lasers for non-invasive monitoring of glucose, ketones, HbA1c, and other blood constituents, M.N. Islam [OMNI-101-PUSA1], U.S. Patent # 9,885,698
- Broadband or Mid-Infrared Fiber Light Sources, M.N. Islam [OMNI-0109-PUSP8], U.S. Patent # 9,726,539
- System and Method for Voice Control of Medical Devices, M.N. Islam [OMNI-0110-PUSP12], U.S. Patent # 9,770,174
- Short-wave infrared super-continuum lasers for early detection of dental caries, M.N. Islam [OMNI-102-PUSA1], U.S. Patent # 9,757,040
- Short-wave infrared super-continuum lasers for natural gas leak detection, exploration, and other active remote sensing applications, M.N. Islam [OMNI-104-PUSA1], U.S. Patent # 9,797,876
- Short-wave infrared super-continuum lasers for early detection of dental caries, M.N. Islam [OMNI-102-PUSA2], U.S. Patent # 9,861,286
- Short-wave infrared super-continuum lasers for natural gas leak detection, exploration, and other active remote sensing applications, M.N. Islam [OMNI-104-PUSA2], U.S. Patent # 9,897,584
- System configured for measuring physiological parameters, M.N. Islam [OMNI-105-PUSP2], U.S. Patent # 10,188,299
- Mid-infrared super-continuum laser, M.N. Islam [OMNI-0109-PUSP9], U.S. Patent # 10,041,832
- Broadband or Mid-Infrared Fiber Light Sources, M.N. Islam [OMNI-0109-PCA1], Canadian Patent # 2,838,355
- Fiber Lasers and Mid-Infrared Light Sources in Methods and Systems for Selective Biological Tissue Processing and Spectroscopy, M.N. Islam [OMNI-108-PEP], European Patent # 2,521,505
- Broadband or mid-infrared fiber light sources, M.N. Islam [OMNI-109-PEP], European Patent # EP 1,949,151
• Light-based spectroscopy with improved signal-to-noise ratio, M.N. Islam [OMNI-105-PUSP3], U.S. Patent # 10,172,523
• Short-wave infrared super-continuum lasers for natural gas leak detection, exploration, and other active remote sensing applications, M.N. Islam [OMNI-104-PUSA3], U.S. Patent # 9,995,722
• Near-infrared time-of-flight imaging, M.N. Islam [OMNI-104-PUSA4], U.S. Patent # 10,126,283
• Short-wave infrared super-continuum lasers and similar light sources for imaging applications, M.N. Islam [OMNI-101-PUSA2], U.S. Patent # 10,136,819
• Near-infrared laser diodes used in imaging applications, M.N. Islam [OMNI-101-PUSA3], U.S. Patent # 10,201,283
• Wearable devices using near-infrared light sources, M.N. Islam [OMNI-102-PUSA3], U.S. Patent # 10,098,546
• Physiological measurement devices using light emitting diodes, M.N. Islam [OMNI-102-PUSA4], U.S. Patent # 10,213,113

**Students Advised**

- Charles Filipiak
- Kaiwen Guo, ECE PHD (admitted 2015)
- Ramon Martinez, Applied Physics PHD
- Tianqu Zhai, ECE PHD (admitted 2018)
Kanicki, Jerzy

Website: http://vhosts.eecs.umich.edu/omelab/

Research Interests: Metal oxide semiconductors thin-film devices and circuits; Transmissive, reflective and emissive flat panel displays; Electrochromic devices; Detectors and active pixel sensors for digital breast tomosynthesis; Biodegradable hydrogels for various applications.

Recent Publications

- Cascaded systems analysis of a-Se/a-Si and a-InGaZnO TFT passive and active pixel sensors for tomosynthesis, Sengupta A., Zhao C., Konstantinidis A., Kanicki J., Physics in Medicine and Biology, 01/10/2019
- Novel Top-Anode OLED/a-IGZO TFTs Pixel Circuit for 8K4K AM-OLEDs, Lai P., Lin C., Kanicki J., IEEE Transactions on Electron Devices, 01/01/2019
- Photoluminescence Study of Amorphous InGaZnO Thin-Film Transistors, Yu E., Lai P., Kanicki J., IEEE Transactions on Electron Devices, 03/01/2018
- 3D Printed Masks and Transfer Stamping Process to Enable the Fabrication of the Hemispherical Organic Photodiodes, Kim H., Moon J., Lee K., Kanicki J., Advanced Materials Technologies, 1/1/2017
- DNA-DODA-based polymer electrolytes for dye sensitized solar cells, Jimenez D., Nogueira A., Kajzar F., Kanicki J., Pawlicka A., Molecular Crystals and Liquid Crystals, 9/22/2017
• Influence of molybdenum trioxide thin film thickness on its electrochemical properties, Lemos R., Alcazar J., Carreno N., Andrade J., Pawlicka A., Kanicki J., Gundel A., Azevedo C., Avellaneda C., Molecular Crystals and Liquid Crystals, 9/22/2017
• Study of current-mode active pixel sensor circuits using amorphous InSnZnO thin-film transistor for 50-mm pixel-pitch indirect X-ray imagers, Cheng M., Zhao C., Kanicki J., Solid-State Electronics, 5/1/2017
• Task-Based Modeling of a 5k Ultra-High-Resolution Medical Imaging System for Digital Breast Tomosynthesis, Zhao C., Kanicki J., IEEE Transactions on Medical Imaging, 9/1/2017
• Three-dimensional cascaded system analysis of a 50 mm pixel pitch wafer-scale CMOS active pixel sensor x-ray detector for digital breast tomosynthesis, Zhao C., Vassiljev N., Konstantinidis A., Speller R., Kanicki J., Physics in Medicine and Biology, 2/13/2017

**Patents**

• Sensor Circuits for X-ray Imagers, J. Kanicki, M.-H. Cheng, C. Zhao and A. Sengupta, filed on October 19, 2018 and assigned U.S. Serial No. 16/165,816

**Students Advised**

• Aunnasha Sengupta, ECE PHD (admitted 2016)
Kim, Hun-Seok

Website: https://kim.engin.umich.edu/

Research Interests: Digital communication algorithm and systems; Ultra low power / ultra high performance VLSI SoC architecture; Computer vision and multimedia signal processing.

Recent Publications

- A 470mW-92.5dBm OOK/FSK Receiver for IEEE 802.11 WiFi LP-WUR, Im J., Kim H., Wentzloff D., ESSCIRC 2018 - IEEE 44th European Solid State Circuits Conference, 10/16/2018
- Artificial neural network algorithms for pulse shape discrimination and recovery of piled-up pulses in organic scintillators, Fu C., Di Fulvio A., Clarke S., Wentzloff D., Pozzi S., Kim H., Annals of Nuclear Energy, 10/01/2018
- A 217mW -82dBm IEEE 802.11 Wi-Fi LP-WUR using a 3rd-harmonic passive mixer, Im J., Kim H., Wentzloff D., Digest of Papers - IEEE Radio Frequency Integrated Circuits Symposium, 08/07/2018
- HDM: Hyper-dimensional modulation for robust low-power communications, Kim H., IEEE International Conference on Communications, 07/27/2018
• A receiver/antenna co-design for a 1.5mJ per fix fully-integrated 10x10x6mm³ GPS logger, Kim H., Chiotellis N., Ansari E., Faisal M., Jang T., Grbic A., Blaauw D., Wentzloff D., 2018 IEEE Custom Integrated Circuits Conference, CICC 2018, 05/09/2018


• Always-On 12-nW Acoustic Sensing and Object Recognition Microsystem for Unattended Ground Sensor Nodes, Jeong S., Chen Y., Jang T., Tsai J., Blaauw D., Kim H., Sylvester D., IEEE Journal of Solid-State Circuits, 01/01/2018


• A 335mW -72dBm receiver for FSK back-channel embedded in 5.8GHz Wi-Fi OFDM packets, Im J., Kim H., Wentzloff D., Digest of Papers - IEEE Radio Frequency Integrated Circuits Symposium, 7/5/2017


Patents Issued
• Low Power Wireless Communication Utilizing OFDM Backchannels, U.S. Patent #419838

Students Advised
• Ang Cao, ECE Master’s
• Yu Chen, ECE PHD (admitted 2017)
• Yao-Shan Hsiao, ECE PHD (admitted 2018)
• Chin-Wei Hsu, ECE PHD (admitted 2017)
• Sung Kim, ECE PHD (admitted 2018)
• Bowen Liu, ECE PHD (admitted 2018)
• Lu Liu, ECE Master’s
• Wenhao Peng, ECE PHD (admitted 2018)
• Siddharth Venkatesan, ECE Master’s
• Mingyu Yang, ECE Master’s
• Li-Xuan Chuo, ECE PHD (admitted 2014, co-advised with Blaauw)
• Ziyun Li, ECE PHD (admitted 2014, co-advised with Blaauw)
• Minchang Cho, ECE PHD (admitted 2015, co-advised with Blaauw)
Kira, Mackillo

Website: https://qstl.engin.umich.edu/

Research Interests: Quantum optoelectronics, semiconductor quantum optics, quantum optics, condensed-matter theory, terahertz spectroscopy, many-body interactions, photon correlations, coherent and ultrafast phenomena, and cluster-expansion approach.

Recent Publications

- Dynamics of charge-transfer excitons in type-II semiconductor heterostructures, Stein M., Lammers C., Richter P., Fuchs C., Stolz W., Koch M., Vanska O., Weseloh M., Kira M., Koch S., Physical Review B, 03/26/2018
- Symmetry-controlled temporal structure of high-harmonic carrier fields from a bulk crystal, Langer F., Hohenleutner M., Huttner U., Koch S., Kira M., Huber R., Nature Photonics, 04/01/2017
- Charge-transfer states and optical transitions at the pentacene-TiO 2 interface, Ljungberg M., Väskä O., Koval P., Koch S., Kira M., Sanchez-Portal D., New Journal of Physics, 03/13/2017
- Ultrahigh Off-Resonant Field Effects in Semiconductors, Huttner U., Kira M., Koch S., Laser and Photonics Reviews, 07/01/2017
Students Advised

- Chihyo Ahn, ECE PHD (co-advised, admitted 2018)
- Markus Borsch, ECE PHD (admitted 2017)
- Benjamin Girodias, Physics PHD (admitted 2016)
- Aaditya Hambarde, ECE PHD (admitted 2018)
- Weiwei Jiang, ECE PHD (admitted 2017)
- Woncheol Lee, ECE PHD (co-advised, admitted 2017)
- Haiyi Liu, ECE PHD (admitted 2018)
- Cody Patterson, Applied Physics (admitted 2017)
- Qiannan Wen, Applied Physics (admitted 2017)
Ku, Pei-Cheng

Website: http://web.eecs.umich.edu/~peicheng/

Research Interests: Optoelectronic devices and materials with current focus on integrated photonics, semiconductor light sources (both classical and quantum) and their applications.

Recent Publications

- Strain effects in gallium nitride adsorption on defective and doped graphene: First-principles calculations, Yan H., Ku P., Gan Z., Liu S., Li P., Crystals, 02/01/2018
- Reducing inhomogeneity in the dynamic properties of quantum dots via self-aligned plasmonic cavities, Demory B., Hill T., Teng C., Deng H., Ku P., Nanotechnology, 01/05/2018
- A variable transmission thin film for visible light, Roberts B., Ghosh M., Ku P., Optics InfoBase Conference Papers, 1/1/2017
- Chip-scale integration of RGB LED pixels for microdisplay, lighting and biophotonics applications, Ku P., Optics InfoBase Conference Papers, 1/1/2017
- Gallium nitride based tactile sensors, Sui J., Ku P., Optics InfoBase Conference Papers, 1/1/2017
- Improving the Radiative Efficiency of InGaN Quantum Dots via an Open Top Cavity, Demory B., Katcher A., Hill T., Teng C., Zhang C., Guo L., Deng H., Ku P., ACS Photonics, 4/19/2017
- Individually addressable micron-sized LED color pixels with integrated condenser lenses, Demory B., Chung K., Sui J., Ku P., Optics InfoBase Conference Papers, 1/1/2017

Students Advised

• Juhyeon Kim, ECE PHD (admitted 2019)
• Tuba Sarwar, ECE PHD (admitted 2018)
Kushner, Mark J.

Website: http://uigelz.eecs.umich.edu/

Research Interests: Computational plasma science and engineering with applications to materials processing, microelectronics, photonics and lasers, biotechnology and medicine, and environment.

Recent Publications

Patents Issued


Students Advised

- Shuo Huang, ECE PHD (admitted 2014)
- Juliusz Kruszelnicki, NERS PHD
- Steven Lanham, CHEM PHD
- Amanda Lietz, NERS PHD
- Jordyn Polito, CHEM PHD
- Chenhui Qu, ECE PHD (admitted 2016)
Lafortune, Stéphane

Website:
https://wiki.eecs.umich.edu/stephane/index.php/Main_Page

Research Interests: System and control theory; Discrete event systems; Application to computer and communication systems.

Recent Publications

- Synthesis of Maximally Permissive Nonblocking Supervisors for the Lower Bound Containment Problem, Yin X., Lafortune S., IEEE Transactions on Automatic Control, 12/01/2018
- Detection and mitigation of classes of attacks in supervisory control systems, Carvalho L., Wu Y., Kwong R., Lafortune S., Automatica, 11/01/2018
- Thirty Years of the Ramadge-Wonham Theory of Supervisory Control: A Retrospective and Future Perspectives [Conference Reports], Lafortune S., Rudie K., Tripakis S., IEEE Control Systems, 08/01/2018
- Enforcement of opacity by public and private insertion functions, Ji Y., Wu Y., Lafortune S., Automatica, 07/01/2018
- Supervisory Control of Labeled Transition Systems Subject to Multiple Reachability Requirements via Symbolic Model Checking, Rawlings B., Lafortune S., Ydstie B., IEEE Transactions on Control Systems Technology, 01/01/2018
- On the history of diagnosability and opacity in discrete event systems, Lafortune S., Lin F., Hadjicostis C., Annual Reviews in Control, 01/01/2018
- From Diagnosability to Opacity: A Brief History of Diagnosability or Lack Thereof, Lafortune S., Lin F., IFAC-PapersOnLine, 7/1/2017
• Scaling the formal synthesis of supervisory control software for multiple robot systems, Hill R., Lafortune S., Proceedings of the American Control Conference, 6/29/2017
• Synthesis of Maximally-Permissive Supervisors for the Range Control Problem, Yin X., Lafortune S., IEEE Transactions on Automatic Control, 8/1/2017
• Verification complexity of a class of observational properties for modular discrete events systems, Yin X., Lafortune S., Automatica, 9/1/2017

**Students Advised**

• Yiding Ji, ECE PHD (admitted 2016)
• Romulo Meira Goes, ECE PHD (admitted 2015)
• Andrew Wintenberg, ECE PHD (co-advised) (admitted 2018)
Lee, Somin Eunice

Website: http://bioplasmonics.org/

Research Interests: Use of nanoscale-dependent properties to enable unique spatial and temporal capabilities needed for quantification in bioscience and medicine; Areas of expertise include plasmonics, nanophotonics, bionanotechnologies.

Recent Publications

- High spatial precision nano-imaging of polarization-sensitive plasmonic particles, Liu Y., Wang Y., Lee S., Progress in Biomedical Optics and Imaging - Proceedings of SPIE, 01/01/2018
- Mechano-optical plasmonic nanoantenna, Lee, S.E., SPIE Photonics West Bios, 2/2/2017

Patents Issued


Students Advised

- Gary Cui, ECE MS (admitted 2018)
- Sam Carano, ECE MS (admitted 2018)
- Longshun Li, BME MS (admitted 2018)
- Christina Liao, ECE PHD (admitted 2017)
- Wei-Kuan Lin, ECE PHD (admitted 2017)
- Yunbo Liu, ECE PHD (admitted 2014)
- Xintao Zhao, ECE PHD (admitted 2017)
Liu, Mingyan

Website: https://liu.engin.umich.edu/

Research Interests: Resource allocation, performance modeling, sequential decision and learning theory, game theory and incentive mechanisms, with applications to large-scale networked systems, cybersecurity and cyber risk quantification.

Recent Publications

• A Reputation-Based Contract for Repeated Crowdsensing with Costly Verification, Dobakhshari D., Naghizadeh P., Liu M., Gupta V., Proceedings of the American Control Conference (ACC), May 2017, Seattle, WA.

**Patents Issued**


**Students Advised**

• Kun Jin, ECE PHD (admitted 2017)
• Mohammadmahdi Khaliligarekani, ECE PHD (admitted 2015)
• Mehrdad Moharrami, ECE PHD (co-advised with V. Subramanian, admitted 2014)
• Chenlan Wang, ECE PHD (admitted 2018)
• Chaowei Xiao, CSE PHD (admitted 2015)
• Xueru Zhang, ECE PHD (admitted 2017)
Lu, Wei

Website: https://liu.engin.umich.edu/

Research Interests: New memory devices such as resistive-random access memory (RRAM), memristor-based logic circuits, neuromorphic computing systems, aggressively scaled transistor devices, electrical transport in low-dimensional systems.

Recent Publications

- Neuromorphic computing with memristive devices, Wen Ma, Mohammed A Zidan, Wei D Lu, *Science China Information Sciences*, 61 (6), 060422 (2018)
- On-Demand Reconfiguration of Nanomaterials: When Electronics Meets Ionics, Jihang

- Field-Programmable Crossbar Array (FPCA) for Reconfigurable Computing, Mohammed A. Zidan, YeonJoo Jeong, Jong Hoon Shin, Chao Du, Zhengya Zhang, and Wei D. Lu, *IEEE Trans Multi-Scale Comp Sys*, 4, 698-710 (2017)

**Patents Issued**

- Sparse Coding with Memristor Networks, Wei Lu, Fuxi, Cai, Patrick, Sheridan, Chao Du, Chao, US Patent #10,171,084

**Students Advised**

- Fuxi Cai, ECE PHD (admitted 2013)
- Seung Hwan Lee, ECE PHD (admitted 2015)
- Fan-Hsuan Meng, ECE PHD (admitted 2017)
- John Moon, ECE PHD (admitted 2015)
- Jong Hoon Shin, ECE PHD (admitted 2014)
- Qiwen Wang, ECE PHD (admitted 2016)
- Xinxin Wang, ECE PHD (admitted 2018)
Mahdavifar, Hessam

Website: https://mahdavifar.engin.umich.edu/

Research Interests: Coding and information theory with applications to wireless communications, data storage, security, and Internet of Things. I am also interested in game theory with applications to social networks.

Recent Publications

- Global Games with Noisy Information Sharing, Mahdavifar H., Beirami A., Touri B., Shamma J., IEEE Transactions on Signal and Information Processing over Networks, 09/01/2018
- Distributed Multi-User Secret Sharing, Soleymani M., Mahdavifar H., IEEE International Symposium on Information Theory - Proceedings, 08/15/2018
- Algebraic List-Decoding in Projective Space: Decoding with Multiplicities and Rank-Metric Codes, Mahdavifar H., Vardy A., IEEE Transactions on Information Theory, 01/01/2018
- A new approach for constructing and decoding maximum rank distance codes, Mahdavifar H., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
- Asymptotically optimal sticky-insertion-correcting codes with efficient encoding and decoding, Mahdavifar H., Vardy A., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
- Fast polarization for non-stationary channels, Mahdavifar H., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
- Scaling exponent of sparse random linear codes over binary erasure channels, Mahdavifar H., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017

Students Advised

- Nasser Aldaghri, ECE PHD (admitted 2017)
- Mohammad Vahid Jamali, ECE PHD (admitted 2017)
- Chin-Jen Pang, ECE PHD (co-advised) (admitted 2017)
- Mahdi Soleymani, ECE PHD (admitted 2017)
Mathieu, Johanna

Website: https://mathieu.engin.umich.edu/

Research Interests: Modeling, estimation, and control of electric loads and storage; Operational and control strategies that reduce the environmental impact, cost, and inefficiency of the power system.

Recent Publications

- Do commercial buildings become less efficient when they provide grid ancillary services?, Keskar, D. Anderson, J. X. Johnson, I. A. Hiskens, and J. L. Mathieu, Energy Efficiency (Accepted).
- Chance constrained reserve scheduling using uncertain controllable loads, Part I: Formulation and scenario-based analysis, M. Vrakopoulou, B. Li, and J.L. Mathieu, IEEE Transactions on Smart Grid (Accepted).
- Chance constrained reserve scheduling using uncertain controllable loads, Part II: Analytical reformulation, Li, M. Vrakopoulou, and J.L. Mathieu, IEEE Transactions on Smart Grid (Accepted).
- Use-phase drives lithium ion battery life cycle environmental impacts when used for frequency regulation, N.A. Ryan, Y. Lin, N. Mitchell-Ward, J.L. Mathieu, and J.X. Johnson, Environmental Science & Technology 52.17 (2018), 10163-10174.
- Policy and market barriers to energy storage providing multiple services, S. Forrester, A. Zaman, J.L Mathieu, and J.X. Johnson, The Electricity Journal 30.9 (2017), 50-56.
• Improving power system voltage stability by using demand response to maximize the distance to the closest saddle-node bifurcation, M. Yao, I.A. Hiskens, and J.L. Mathieu. IEEE Conference on Decision and Control. 2018.
• Benchmarking of aggregate residential load models used for demand response, G.S. Ledva, S. Peterson, and J.L Mathieu. IEEE PES General Meeting. 2018.

Students Advised

• Gregory Ledva, ECE PHD (admitted 2014)
• Bowen Li, ECE PHD (admitted 2013)
• Stephanie Ross, ECE PHD (admitted 2014)
• Anna Stuhlmacher, ECE PHD (admitted 2017)
• Mengqi Yao, ECE PHD (admitted 2016)
Meerkov, Semyon M.

Research Interests: Control of systems with nonlinear sensors and actuators, Resilient monitoring and control under malicious attacks; Smart production systems: theory and industrial applications in the framework of Industry 4.0.

Recent Publications


Patents Issued

- Programmable manufacturing advisor for smart production systems, P Alavian, S.M. Meerkov and L. Zhang, Provisional application filed on 10/18/2018.

Students Advised

- Kang Liu, ECE PHD (admitted 2018)
Mi, Zetian

Website: https://mi.engin.umich.edu/

Research Interests: III-nitride semiconductors, low dimensional nanostructures, LEDs, lasers, Si photonics, solar fuels.

Recent Publications

- AlGaN Nanowires: Path to Electrically Injected Semiconductor Deep Ultraviolet Lasers, Zhao S., Mi Z., IEEE Journal of Quantum Electronics, 12/01/2018
- Gallium nitride nanowire as a linker of molybdenum sulfides and silicon for photoelectrocatalytic water splitting, Zhou B., Kong X., Vanka S., Chu S., Ghamari P., Wang Y., Pant N., Shih I., Guo H., Mi Z., Nature Communications, 12/01/2018
- Characterizing the electrical breakdown properties of single n-i-n-n+:GaN nanowires, Qu J., Wang R., Sun Y., Shih I., Mi Z., Liu X., Applied Physics Letters, 11/05/2018
- High Efficiency Si Photocathode Protected by Multifunctional GaN Nanostructures, Vanka S., Arca E., Cheng S., Sun K., Botton G., Teeter G., Mi Z., Nano Letters, 10/10/2018
- Effect of growth temperature on the structural and optical properties of few-layer hexagonal boron nitride by molecular beam epitaxy, Laleyan D., Mengle K., Zhao S., Wang Y., Kioupakis E., Mi Z., Optics Express, 09/03/2018
- Efficient coupling of disorder states to excitons in an InGaN nanostructure, Nelson C., Ra Y., Mi Z., Steel D., Physical Review B, 08/13/2018
• Carrier relaxation dynamics of InGaN/GaN dot-in-nanowires, George H., Ra Y., Mi Z., Norris T., 2018 Conference on Lasers and Electro-Optics, CLEO 2018 - Proceedings, 08/06/2018
• Rolled-up SiOx/SiNx microtubes with an enhanced quality factor for sensitive solvent sensing, Song P., Chen C., Qu J., Ou P., Dastjerdi M., Mi Z., Song J., Liu X., Nanotechnology, 08/03/2018
• Charge carrier transport properties of Mg-doped Al0.6Ga0.4N grown by molecular beam epitaxy, Liu X., Pandey A., Laleyan D., Mashooq K., Reid E., Shin W., Mi Z., Semiconductor Science and Technology, 07/11/2018
• Solar Water Oxidation by an InGaN Nanowire Photoanode with a Bandgap of 1.7 eV, Chu S., Vanka S., Wang Y., Gim J., Ra Y., Houden R., Guo H., Shih I., Mi Z., ACS Energy Letters, 02/09/2018
• Electrical characterization of Si/InN nanowire heterojunctions, Alagha S., Zhao S., Mi Z., Watkins S., Kavanagh K., Semiconductor Science and Technology, 01/01/2018
• Heteroepitaxy of Fin-Shaped InGaN Nanoridge Using Molecular Beam Epitaxy, Park Y., Gim J., Yalisove R., Houden R., Mi Z., Crystal Growth and Design, 01/01/2018
• Towards enhancing photocatalytic hydrogen generation: Which is more important, alloy synergistic effect or plasmonic effect, Xu Z., Kibria M., AlOtaibi B., Duchesne P., Besteiro L., Gao Y., Zhang Q., Mi Z., Zhang P., Govorov A., Mai L., Chaker M., Ma D., Applied Catalysis B: Environmental, 01/01/2018
• Optically active dilute-antimonide III-nitride nanostructures for optoelectronic devices, Chowdhury F., Sadaf S., Shi Q., Chen Y., Guo H., Mi Z., Applied Physics Letters, 8/7/2017
• A Monolithically Integrated InGaN Nanowire/Si Tandem Photoanode Approaching the Ideal Bandgap Configuration of 1.75/1.13 eV, Fan S., Shih I., Mi Z., Advanced Energy Materials, 1/25/2017
• Al(Ga)N Nanowire Deep Ultraviolet Optoelectronics, Zhao S., Mi Z., Semiconductors and Semimetals, 12/1/2017
• AlGaN nanowire deep ultraviolet optoelectronics, Zhao S., Liu X., Mi Z., Summer Topicals Meeting Series, SUM 2017, 8/17/2017
• AlN/h-BN Heterostructures for Mg Dopant-Free Deep Ultraviolet Photonics, Laleyan D., Zhao S., Woo S., Tran H., Le H., Szkopek T., Guo H., Botton G., Mi Z., Nano Letters, 6/14/2017
• An AlGaN Core-Shell Tunnel Junction Nanowire Light-Emitting Diode Operating in the Ultraviolet-C Band, Sadaf S., Zhao S., Wu Y., Ra Y., Liu X., Vanka S., Mi Z., Nano Letters, 2/8/2017
• Artificial Photosynthesis on III-Nitride Nanowire Arrays, Chu S., Kong X., Vanka S., Guo H., Mi Z., Semiconductors and Semimetals, 1/1/2017
• Electrical characterization of Si/InN nanowire heterojunctions, Alagha S., Zhao S., Mi Z., Watkins S., Kavanagh K., Semiconductor Science and Technology, 1/1/2018
• InGaN nanowire integrated nanophotonics, Mi Z., Ra Y., Rashid R., Wang R., Shih I., Summer Topicals Meeting Series, SUM 2017, 8/17/2017
• InN Nanowires: Epitaxial Growth, Characterization, and Device Applications, Zhao S., Mi Z., Semiconductors and Semimetals, 12/1/2017
• On the mechanism of highly efficient p-type conduction of Mg-doped ultra-wide-bandgap AlN nanostructures, Tran N., Le B., Zhao S., Mi Z., Applied Physics Letters, 1/16/2017
• Photorechargeable High Voltage Redox Battery Enabled by Ta 3 N 5 and GaN/Si Dual-Photoelectrode, Cheng Q., Fan W., He Y., Ma P., Vanka S., Fan S., Mi Z., Wang D., Advanced Materials, 7/12/2017
• Preface, Mi Z., Wang L., Jagadish C., Semiconductors and Semimetals, 1/1/2017
• Recent advances on p-type III-nitride nanowires by molecular beam epitaxy, Zhao S., Mi Z., Crystals, 9/1/2017
• Scalable Nanowire Photonic Crystals: Molding the Light Emission of InGaN, Ra Y., Rashid R., Liu X., Lee J., Mi Z., Advanced Functional Materials, 10/12/2017
• Sub- meV decoherence-induced population pulsation resonances in an InGaN system, Nelson C., Ra Y., Mi Z., Berman P., Steel D., Physical Review B, 9/5/2017
• Welcome to the 2017 IEEE Photonics Society Summer Topicals Meeting Series, Mi Z., Summer Topicals Meeting Series, SUM 2017, 8/17/2017

**Students Advised**

• Chihyo Ahn, ECE PHD (co-advised) (admitted 2018)
• David Laleyan, ECE PHD (admitted 2016)
• Xiwen Liu, ECE PHD (admitted 2018)
• Kishwar Mashooq, ECE PHD
• Ayush Pandey, ECE PHD (co-advised) (admitted 2017)
• Eric Reid, ECE PHD (admitted 2017)
• Walter Jin Shin, ECE PHD (admitted 2017)
• Yongjie Wang, ECE PHD (admitted 2016)
• Aagnick Pant, Applied Physics PHD (admitted 2018)
Michielssen, Eric

Website: https://michielssen.engin.umich.edu/

Research Interests: Computational, applied, and theoretical electromagnetics; antennas; microwave and millimeter wave circuits and packaging.

Recent Publications

- Computational design of composite EMI shields through the control of pore morphology, Bregman A., Taub A., Michielssen E., MRS Communications, 09/01/2018
- Reference-less method for computing the transmission matrix of a multimode fiber, N'Gom M., Norris T., Michielssen E., Nadakuditi R., 2018 Optical Fiber Communications Conference and Exposition, OFC 2018 - Proceedings, 06/13/2018
- A butterfly-based direct solver using hierarchical LU factorization for Poggio-Miller-Chang-Harrington-Wu-Tsai equations, Guo H., Liu Y., Hu J., Michielssen E., Microwave and Optical Technology Letters, 06/01/2018
- The ICVSIE: A General Purpose Integral Equation Method for Bio-Electromagnetic Analysis, Gomez L., Yucel A., Michielssen E., IEEE Transactions on Biomedical Engineering, 03/01/2018
- Mode control in a multimode fiber through acquiring its transmission matrix from a reference-less optical system, N'Gom M., Norris T., Michielssen E., Nadakuditi R., Optics Letters, 02/01/2018
- Reference-less method for computing the transmission matrix of a multimode fiber, N'Gom M., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 01/01/2018
• Controlled transmission through highly scattering media using semi-definite programming as a phase retrieval computation method, N'Gom M., Estakhri N., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 01/01/2018

• Parallel Wideband MLFMA for Analysis of Electrically Large, Non-Uniform, Multiscale Structures, Hughey S., Aktulga H., Vikram M., Lu M., Shanker B., Michielssen E., IEEE Transactions on Antennas and Propagation, 01/01/2018


• A butterfly-based direct integral-equation solver using hierarchical LU factorization for analyzing scattering from electrically large conducting objects, Guo H., Liu Y., Hu J., Michielssen E., IEEE Transactions on Antennas and Propagation, 9/1/2017


• Non-holographic method to compute the transmission matrix of a multimode fiber for mode control, Gom M., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 1/1/2017

• An HSS Matrix-Inspired Butterfly-Based Direct Solver for Analyzing Scattering from Two-Dimensional Objects, Liu Y., Guo H., Michielssen E., IEEE Antennas and Wireless Propagation Letters, 1/1/2017

• Internally Combined Volume-Surface Integral Equation for a 3-D Electromagnetic Scattering Analysis of High-Contrast Media, Gomez L., Yucel A., Michielssen E., IEEE Antennas and Wireless Propagation Letters, 1/1/2017

• Non-Holographic Method to Compute the Transmission Matrix of a Multimode Fiber for Mode Control, N'Gom, M., Norris, T. B., Michielssen, E., & Nadakuditi, R. R., In Frontiers in Optics (pp. FTh4A-1). Optical Society of America, 1/1/2017

**Students Advised**

- Max Bright, ECE PHD (admitted 2018)
Mortazawi, Amir

Website: https://mortazawi.engin.umich.edu/

Research Interests: RF and microwave circuits including: microwave and millimeter-wave power amplifiers, spatial power combining and thin film ferroelectric based frequency agile circuits.

Recent Publications

- Rectifier Array with Adaptive Power Distribution for Wide Dynamic Range RF-DC Conversion, Wang X., Mortazawi A., IEEE Transactions on Microwave Theory and Techniques, 01/01/2019
- Intrinsically Switchable Filter Bank Employing Ferroelectric Barium Strontium Titanate, Koohi M., Mortazawi A., IEEE Transactions on Microwave Theory and Techniques, 09/11/2018
- On the Linearity of BST Thin Film Bulk Acoustic Resonators, Koohi M., Mortazawi A., 2018 IEEE MTT-S International Microwave Workshop Series on Advanced Materials and Processes for RF and THz Applications, IMWS-AMP 2018, 09/06/2018
- A New Integrated K-Band Analog Vector Sum Phase Shifter, Akbar F., Mortazawi A., IEEE MTT-S International Microwave Symposium Digest, 08/17/2018
- A Compact Intrinsically Switchable Filter Bank Employing Multifunctional Ferroelectric BST, Koohi M., Mortazawi A., IEEE MTT-S International Microwave Symposium Digest, 08/17/2018
- Compact intrinsically switchable FBAR filters utilizing ferroelectric BST, Zolfagharloo Koohi M., Lee S., Mortazawi A., IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control, 08/01/2018
- Scalable phased array architectures with a reduced number of tunable phase shifters, F. Akbar and A. Mortazawi, IEEE Trans. Microw. Theory Techn, 9/1/2017
• A frequency tunable 360° analog CMOS phase shifter with an adjustable amplitude, F. Akbar and A. Mortazawi, IEEE Trans. Circuits Syst. II, 12/1/2017

**Patents Issued**

• Wide Dynamic Range Rectifier Circuits, Patent #: 9768708

**Students Advised**

• Omar Abdelatty, ECE PHD (co-advised) (admitted 2015)
• Ruiying Chai, ECE PHD (admitted 2018)
• Suhyun Nam, ECE PHD (admitted 2017)
• Milad Zolfagharloo Koohi, ECE PHD (admitted 2014)
Nadakuditi, Rajesh R.

Website: https://web.eecs.umich.edu/~rajnrao/

Research Interests: Statistical signal processing, random matrix theory, random graphs and light transport through opaque random media.

Recent Publications

- Reference-less method for computing the transmission matrix of a multimode fiber, N’Gom M., Norris T., Michielssen E., Nadakuditi R., 2018 Optical Fiber Communications Conference and Exposition, OFC 2018 - Proceedings, 06/13/2018
- Efficient online dictionary adaptation and image reconstruction for dynamic MRI, Ravishankar S., Moore B., Nadakuditi R., Fessier J., Conference Record of 51st Asilomar Conference on Signals, Systems and Computers, ACSSC 2017, 04/10/2018
- Augmented robust PCA for foreground-background separation on noisy, moving camera video, Gao C., Moore B., Nadakuditi R., 2017 IEEE Global Conference on Signal and Information Processing, GlobalSIP 2017 - Proceedings, 03/07/2018
- Robust photometric stereo using learned image and gradient dictionaries, Wagenmaker A., Moore B., Nadakuditi R., Proceedings - International Conference on Image Processing, ICIP, 02/20/2018
- Robust surface reconstruction from gradients via adaptive dictionary regularization, Wagenmaker A., Moore B., Nadakuditi R., Proceedings - International Conference on Image Processing, ICIP, 02/20/2018
- Mode control in a multimode fiber through acquiring its transmission matrix from a reference-less optical system, N’Gom M., Norris T., Michielssen E., Nadakuditi R., Optics Letters, 02/01/2018
- Reference-less method for computing the transmission matrix of a multimode fiber, N’Gom M., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 01/01/2018
• Controlled transmission through highly scattering media using semi-definite programming as a phase retrieval computation method, N’Gom M., Estakhri N., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 01/01/2018
• NLP-driven citation analysis for scientometrics, Jha R., Jbara A., Qazvinian V., Radev D., Natural Language Engineering, 1/1/2017
• Improved Detection of Correlated Signals in Low-Rank-Plus-Noise Type Data Sets Using Informative Canonical Correlation Analysis (ICCA), Asendorf N., Nadakuditi R., IEEE Transactions on Information Theory, 6/1/2017
• Efficient Sum of Outer Products Dictionary Learning (SOUP-DIL) and Its Application to Inverse Problems, S. Ravishankar, R. R. Nadakuditi and J. A. Fessler, IEEE Transactions on Computational Imaging, 1/1/2017
• Improved detection of correlated signals in low-rank-plus-noise type datasets using Informative Canonical Correlation Analysis (ICCA), N. A. Asendorf and R. R. Nadakuditi, IEEE Transactions on Information Theory, 1/1/2017
• Non-holographic method to compute the transmission matrix of a multimode fiber for mode control, M. N’gom, T. B. Norris, E. Michielssen, and R. R. Nadakuditi, Frontiers in Optics, 1/1/2017

Students Advised

• Arvind Prasadan, ECE PHD (admitted 2014)
• Rishi Sonthalia (AIM Math)
• Hao Wu (AIM Math) Applied & Interdisc. Mathematics
Najafi, Khalil

Website: https://najafi.engin.umich.edu/

Research Interests: Solid-state integrated sensors, microactuators, micromechanics, analog and digital integrated circuits.

Recent Publications

- On-chip capacitive sensing and tilting motion estimation of a micro-stage for in situ MEMS gyroscope calibration, Chen Y., Aktakka E., Woo J., Najafi K., Oldham K., Mechatronics, 12/01/2018
- Thick High Aspect-Ratio Biomimetic Silicon Hair Sensors as Accelerometers, Tang Y., Najafi K., Journal of Microelectromechanical Systems, 01/01/2018
• A 2kPa per stage and 1.3sccm flow rate modular two-stage electrostatic gas micropump with stiffened drive electrodes, Sandoughsaz A., Najafi K., Bernal L., Proceedings of IEEE Sensors, 1/5/2017

Patents Issued
• Actuation and sensing platform for sensor calibration and vibration isolation, K. Najafi, E. E. Aktakka, Patent #: 9874459
• Microsystem Device and Methods for Fabricating the Same, K. Najafi, R. L. Peterson, J. Cho, Z. Cao, G. He, J. A. Gregory, and Y. Yuan, Patent #: 9778039
• Three-Dimensional Microstructures And Fabrication Process, K. Najafi, T. Nagourney, and J. Cho, Patent #: 9796586

Students Advised
• Farzad Asgarian, ECE PHD (admitted 2014)
• Christopher Boyd, ECE PHD (admitted 2012)
• Behnoush Rostami, ECE PHD (admitted 2017)
• Seyed Amin Sandoughsaz Zardini, ECE PHD (admitted 2013)
• Sajal Singh, ECE PHD (admitted 2016)
• Donguk Yang, ECE PHD (admitted 2014)
• Yi Yuan, ECE PHD (admitted 2012)
Norris, Ted

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Research Interests: Application of femtosecond optical techniques to the physics of semiconductor nanostructures, in developing new ultrafast optical and optoelectronic measurement techniques, THz generation and measurement, plasmonics in nanostructures, and novel methods for biological imaging and in vivo sensing.

Recent Publications

- Nanoscale fingerprinting with hyperbolic metamaterials, Huang Z., Narimanov E., Norris T., 2018 Conference on Lasers and Electro-Optics, CLEO 2018 - Proceedings, 08/06/2018
- Carrier relaxation dynamics of InGaN/GaN dot-in-nanowires, George H., Ra Y., Mi Z., Norris T., 2018 Conference on Lasers and Electro-Optics, CLEO 2018 - Proceedings, 08/06/2018
- Reference-less method for computing the transmission matrix of a multimode fiber, N'Gom M., Norris T., Michielssen E., Nadakuditi R., 2018 Optical Fiber Communications Conference and Exposition, OFC 2018 - Proceedings, 06/13/2018
- Mode control in a multimode fiber through acquiring its transmission matrix from a reference-less optical system, N'Gom M., Norris T., Michielssen E., Nadakuditi R., Optics Letters, 02/01/2018
- Dipole-like electrostatic asymmetry of gold nanorods, Kim J., Han M., Lien M., Magonov S., Zhu Y., George H., Norris T., Kotov N., Science Advances, 02/01/2018
- Local Conditioning on undirected graphs, Reyes M., Neuhoff D., 2017 Information Theory and Applications Workshop, ITA 2017, 8/30/2017
• Interband effects on hot carrier relaxation in titanium nitride films, Ferguson H., Guler U., Kinsey N., Shalaev V., Norris T., Boltasseva A., Optics InfoBase Conference Papers, 1/1/2017
• Non-holographic method to compute the transmission matrix of a multimode fiber for mode control, NGom M., Norris T., Michielssen E., Nadakuditi R., Optics InfoBase Conference Papers, 1/1/2017

**Patents Issued**

• Light Field Imaging with Transparent Photodetectors, Theodore B. Norris, Zhaohui Zhong, Jeffrey A. Fessler, Che-Hung Liu, You-Chia Chang, and Mmiao-bin Lien Patent #: Serial No. 15,430,043
• Photodetector Based on Double Layer Heterostructures, Z. Zhong, T.B. Norris, C.-H. Liu, and Y.-C. Chang Patent #: 9680038

**Students Advised**

• Zhengyu Huang, ECE PHD (admitted 2017)
• Nooshin Mohammadi Estakhri, ECE PHD (admitted 2013)
• Zhen Xu, ECE PHD (admitted 2016)
Ozay, Necmiye

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Research Interests: Computational aspects of control system design; hybrid and cyber-physical systems; system identification and validation; dynamics-based data analysis.

Recent Publications

Optimal Gear Shift Schedule Design for Automated Vehicles: Hybrid System Based Analytical Approach, He C., Qin W., Ozay N., Orosz G., IEEE Transactions on Control Systems Technology, 11/1/2018
Guaranteed model-based fault detection in cyber-physical systems: A model invalidation approach, Harirchi F., Ozay N., Automatica, 7/1/2018
Incremental Segmentation of ARX Models, Chou G., Ozay N., Berenson D., IFAC-PapersOnLine, 7/1/2018
A Robust Algorithm for Online Switched System Identification, Du Z., Balzano L., Ozay N., IFAC-PapersOnLine, 7/1/2018
Active Model Discrimination with Applications to Fraud Detection in Smart Buildings, Harirchi F., Yong S., Jacobsen E., Ozay N., IFAC-PapersOnLine, 7/1/2017
On a class of maximal invariance inducing control strategies for large collections of switched systems, Nilsson P., Ozay N., HSCC 2017 - Proceedings of the 20th International Conference on Hybrid Systems: Computation and Control (part of CPS Week), 4/13/2017
Robustification and Parametrization of Switching Controllers for a Class of Set Invariance Problems, Yang L., Ozay N., IFAC-PapersOnLine, 7/1/2017
Weak adaptive submodularity and group-based active diagnosis with applications to state estimation with persistent sensor faults, Yong S., Gao L., Ozay N., Proceedings of the American Control Conference, 6/29/2017
**Students Advised**

- Glen Chou, ECE PHD (co-advised) (admitted 2017)
- Zhe Du, ECE PHD (co-advised) (admitted 2017)
- Lixing Huang, ROB PHD (co-advised) (admitted 2017)
- Zexiang Liu, ECE PHD (admitted 2018)
- Kwesi Rutledge, ECE PHD (admitted 2017)
- Yunus Sahin, ECE PHD (admitted 2014)
- Andrew Wintenberg, ECE PHD (co-advised) (admitted 2018)
- Liren Yang, ECE PHD (admitted 2015)
Peterson, Becky

Website: https://sites.google.com/a/umich.edu/petersonlab/

Research Interests: Oxide semiconductor materials and devices; 3D-IC heterointegration of oxide-based thin film electronics with silicon CMOS; solution-processed inorganic electronic materials; crystalline gallium oxide for power devices.

Recent Publications

- Observation of impurity band conduction and variable range hopping in heavily doped (010) β-Ga2O3, Kabilova Z., Kurdak C., and Peterson R.L., Semiconductor Science and Technology, 2/6/2019
- Exploiting In Situ Redox and Diffusion of Molybdenum to Enable Thin-Film Circuitry for Low-Cost Wireless Energy Harvesting, Son Y., Peterson R.L., Advanced Functional Materials, 11/30/2018
- The effects of localized tail states on charge transport mechanisms in amorphous zinc tin oxide Schottky diodes, Son Y., Peterson R.L., Semiconductor Science and Technology, 11/7/2017
- Increased blocking voltage in solution processed ZTO HVTFTs through drain offset, Allemang C., Peterson R.L., 2017 75th Annual Device Research Conference Digest, IEEE, 6/25-28/2017
- In Situ Chemical Modification of Schottky Barrier in Solution-Processed Zinc Tin Oxide Diode, Son Y., Li J., Peterson R.L., ACS Applied Materials and Interfaces 8/25/2016

Patents Issued
• Microsystem device and methods for fabricating the same, K. Najafi, R. L. Peterson, J. Y. Cho, Z. Cao, G. He, J. Gregory, Y. Yuan, Patent #: 9778039

**Students Advised**

• Christopher Allemang, ECE PHD (admitted 2016)
• Baran Demir, ECE PHD (admitted 2016)
• Jaesung Jo, ECE PHD (admitted 2018)
• Zumrad Kabilova, ECE PHD (admitted 2016)
• Ming-Hsun Lee, MSE PHD (admitted 2019)
• Youngbae Son, ECE PHD (admitted 2014)
• Hannah Masten, ECE PHD (co-advised) (admitted 2016)
Phillips, Jamie D.

Website: https://phillips.engin.umich.edu/

Research Interests: Optoelectronic materials and devices for the next generation of infrared imagers, photovoltaics, and thin film electronics.

Recent Publications


**Patents Issued**


**Current Doctoral Students**

• Hannah Masten, ECE PHD (co-advised) (admitted 2016)
• Minhyung Ahn, ECE PHD (admitted 2015)
• Michael Barrow, ECE PHD (admitted 2016)
• Justin Easley, Applied Physics PHD (expected graduation 2019)
• Eunseong Moon, ECE PHD (admitted 2015)
Pradhan, S. Sandeep

**Website:** https://pradhan.engin.umich.edu/

**Research Interests:** Distributed compression, sensor networks, information theory, channel coding, and multirate signal processing.

**Recent Publications**

- Lattices from Linear Codes and Fine Quantization: General Continuous Sources and Channels, Shirani F., Pradhan S., IEEE International Symposium on Information Theory - Proceedings, 08/15/2018
- An Achievable Rate-Distortion Region for Multiple Descriptions Source Coding Based on Coset Codes, Shirani F., Pradhan S., IEEE Transactions on Information Theory, 05/01/2018
- Achievable Rate Region for Three User Discrete Broadcast Channel Based on Coset Codes, Padakandla A., Sandeep Pradhan S., IEEE Transactions on Information Theory, 04/01/2018
- A new achievable rate region for multiple-access channel with states, Heidari M., Shirani F., Pradhan S., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
- An Achievable Rate Region Based on Coset Codes for Multiple Access Channel with States, Padakandla A., Pradhan S., IEEE Transactions on Information Theory, 10/1/2017
- On the correlation between Boolean functions of sequences of random variables, Chaharsooghi F., Sandeep Pradhan S., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
- On the necessity of structured codes for communications over MAC with feedback, Heidari M., Shirani F., Sandeep Pradhan S., IEEE International Symposium on Information Theory - Proceedings, 8/9/2017
Students Advised

- Touheed Anwar Atif, ECE PHD (admitted 2017)
- Tyler Doiron, ECE Master's (co-advised)
- Mohsen Heidari Khoozani, ECE PHD (admitted 2013)
- Chin-Jen Pang, ECE PHD (co-advised) (admitted 2017)
Rand, Stephen

Website: https://rand.engin.umich.edu/

Research Interests: Optical magnetism and optical refrigeration.

Recent Publications

- Evidence of magnetic torque dynamics in optically-induced magnetization, Makhal K., Trinh M., Rand S., Optics Express (to be published)
- Holographic imaging through a scattering medium by diffuser-aided statistical averaging, M. Purcell, M. Kumar, S.C. Rand, and V. Lakshminarayanan, J.O.S.A. A 33, 1291(2016).
Patents Issued


Students Advised

- Laura Andre, ECE PHD; Innovation & Entrepreneur Cert (admitted 2016)
- Long Cheng, ECE PHD (admitted 2017)
- Gregory Smail, Applied Physics PHD (admitted 2018)
- Cameron Spitzfaden, Physics PHD (admitted 2017)
Revzen, Shai

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Research Interests: Bio-inspired control; dynamical systems; biomechanics; legged locomotion; modular robotics.

Recent Publications

- Geometrically optimal gaits: a data-driven approach, Bittner B., Hatton R., Revzen S., Nonlinear Dynamics, 11/01/2018
- Global linearization and fiber bundle structure of invariant manifolds, Eldering J., Kvalheim M., Revzen S., Nonlinearity, 08/02/2018
- Why We Need More Degrees of Freedom, Revzen S., Koditschek D., Procedia IUTAM, 1/1/2017

Students Advised

- Brian Bittner, ROB PHD
- George Council, ECE PHD (admitted 2014)
- Yue Sun, ROB PHD
- Dan Zhao, ME PHD
Sarabandi, Kamal

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Research Interests: Microwave and millimeter wave radar technology; geoscience and remote sensing; antennas and wave propagation; metamaterials.

Recent Publications

- A W-Shaped Antenna with Spatial Polarization Variation for Direction Finding, Choi S., Sarabandi K., IEEE Antennas and Wireless Propagation Letters, 12/01/2018
- Excitation of Space Wave, Leaky Wave, and Creeping Waves in Cylindrical Media, Singh M., Ghosh B., Sarabandi K., IEEE Transactions on Antennas and Propagation, 12/01/2018
- A Sub-THz Rectangular Waveguide Phase Shifter Using Piezoelectric-Based Tunable Artificial Magnetic Conductor, Ibrahim A., Shaman H., Sarabandi K., IEEE Transactions on Terahertz Science and Technology, 11/01/2018
- A Tunable, High-Gain, Very Low-Profile Composite Monopole Antenna for Low-Frequency Applications, Rao M., Sarabandi K., IEEE Transactions on Antennas and Propagation, 07/01/2018
- Superresolution DoA Estimation with Circular Arrays Using Signal Segregation Algorithm in Conjunction with a Nulls-Synthesis Method, Amjadi S., Sarabandi K., IEEE Transactions on Antennas and Propagation, 06/01/2018
- Loop Excitation of a Conical Horn, Ghosh B., Chakraborty K., Santra G., Sarabandi K., IEEE Transactions on Antennas and Propagation, 06/01/2018
- Fragmented antenna realization using coupled small radiating elements, Barani N., Harvey J., Sarabandi K., IEEE Transactions on Antennas and Propagation, 04/01/2018
- Evaluation of Efficient Green's Functions for Spherically Stratified Media, Bhattacharya D., Ghosh B., Goswami P., Sarabandi K., IEEE Transactions on Antennas and Propagation, 03/01/2018
• A High-Isolation Two-Port Planar Antenna System for Communication and Radar Applications, Douglas T., Sarabandi K., IEEE Access, 02/1/2018
• All-Directions Through-the-Wall Imaging Using a Small Number of Moving Omnidirectional Bi-Static FMCW Transceivers, Yektakhah B., Sarabandi K., IEEE Transactions on Geoscience and Remote Sensing, 01/01/2018
• A Wideband Circularly Polarized Omnidirectional Antenna Based on Excitation of Two Orthogonal Circular TE 21 Modes, Yektakhah B., Sarabandi K., IEEE Transactions on Antennas and Propagation, 8/1/2017
• Vehicular Optically Transparent UHF Antenna for Terrestrial Communication, Kashanianfard M., Sarabandi K., IEEE Transactions on Antennas and Propagation, 8/1/2017
• A low-profile, high-gain, and full-band subarray of cavity-backed slot antenna, Amjadi S., Sarabandi K., IEEE Transactions on Antennas and Propagation, 7/1/2017
• A compact single conductor transmission line launcher for telemetry in borehole drilling, Amjadi S., Sarabandi K., IEEE Transactions on Geoscience and Remote Sensing, 5/1/2017
• Compact Omnidirectional Circularly Polarized Antenna, Wu J., Sarabandi K., IEEE Transactions on Antennas and Propagation, 4/1/2017
• Function-Reconfigurable Between SPDT Switch and Power Divider Based on Switchable HMSIW Unit, Chen H., Che W., Cao Y., Feng W., Sarabandi K., IEEE Microwave and Wireless Components Letters, 3/1/2017
• An Accurate Circuit Model for Input Impedance and Radiation Pattern of Two-Port Loop Antennas as E- and H-Probe, Kashanianfard M., Sarabandi K., IEEE Transactions on Antennas and Propagation, 1/1/2017
• Directional Full-Duplex RF Booster for 2450 MHz ISM Band, Kashanianfard M., Sarabandi K., IEEE Transactions on Antennas and Propagation, 1/1/2017


- Localization via the Received Signal Strength Gradient at Lower VHF, Verma, G., F. Dagefu, B. Sadler, and K. Sarabandi, Proceedings: IEEE International Symposium on


**Patents Issued**

• Non-Contact On-Wafer S-Parameter Measurements of Devices at Millimeter-Wave to Terahertz Frequencies, K. Sarabandi, A. Jam, and M. Moallem, U.S. Patent No. 9,941,560, April 10, 2018.

**Students Advised**

• Abdulrahman Alaeeel, ECE PHD (admitted 2018)
• Seyed Mohammad Amjadi, ECE PHD (admitted 2013)
• Navid Barani Lonbani, ECE PHD (admitted 2015)
• Michael Benson, ECE PHD (admitted 2010)
• Xiuzhang Cai, ECE PHD (admitted 2014)
• Tanner Douglas, ECE PHD (admitted 2016)
• David Geroski, Applied Physics PHD (admitted 2016)
• Michael Giallorenzo, ECE PHD (admitted 2016)
• Seyedmohammad Mousavi, ECE PHD (admitted 2015)
• Abdelhamid Nasr, ECE PHD (admitted 2018)
• Nazanin Rahmati, ECE PHD
• Menglou Rao, ECE PHD (admitted 2018)
• Behzad Yektakhah, ECE PHD (admitted 2013)
• Mostafa Zaky, ECE PHD (admitted 2015)
Scott, Clayton D.

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Research Interests: Machine learning theory, methods, and applications.

Recent Publications

- Optimal change point detection in Gaussian processes, Keshavarz H., Scott C., Nguyen X., Journal of Statistical Planning and Inference, 2/1/2018
- Sparse Approximation of a Kernel Mean, Cortes E., Scott C., IEEE Transactions on Signal Processing, 3/1/2017

Students Advised

- Aniket Anand Deshmukh, ECE PHD (admitted 2015)
- Julian Katz-Samuels, ECE PHD; Comput Discovery & Engin Cert (admitted 2016)
- Alexander Ritchie, ECE PHD (co-advised) (admitted 2017)
- Yutong Wang, ECE PHD (co-advised) (admitted 2016)
Stark, Wayne E.

Website: https://stark.engin.umich.edu/

Research Interests: Wireless Communications; mobile communications; spread-spectrum communications; coding theory.

Recent Publications

- Bounds on Error Probability for Direct-Sequence Spread-Spectrum Multiple-Access Communications, Borth D., Pursley M., Sarwate D., Stark W., Technology Review, 1/1/2017
Steel, Duncan

Website: https://dsteel.engin.umich.edu/

Research Interests: Laser spectroscopy, optical physics, condensed matter physics, biophysics, quantum computing.

Recent Publications

- Interactions of amyloid-b peptides on lipid bilayer studied by single molecule imaging and tracking, Chang C., Edwald E., Veatch S., Steel D., Gafni A., Biochimica et Biophysica Acta - Biomembranes, 09/01/2018
- Efficient coupling of disorder states to excitons in an InGaN nanostructure, Nelson C., Ra Y., Mi Z., Steel D., Physical Review B, 08/13/2018
- Generation of frequency sidebands on single photons with indistinguishability from quantum dots, Paudel U., Burgers A., Steel D., Yakes M., Bracker A., Gammon D., Physical Review A, 07/10/2018
- Sub- meV decoherence-induced population pulsation resonances in an InGaN system, Nelson C., Ra Y., Mi Z., Berman P., Steel D., Physical Review B, 9/5/2017

Students Advised

- Darwin Cordovilla, Applied Physics PHD
- Jesus Hinojosa, Applied Physics PHD
- Weishu Wu, ECE Master’s student
Subramanian, Vijay

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Research Interests: Social networks, network economics, random graphs, communication networks, information theory, stochastic modeling, and applied probability.

Recent Publications

- Balanced Allocation on Graphs with Random Walk Based Sampling, D. Tang and V. G. Subramanian, 2018 56th Annual Allerton Conference on Communication, Control, and Computing (Allerton), Monticello, IL, USA, 2018
- Local Weak Convergence Based Analysis of a New Graph Model, M. Moharrami, V. Subramanian, M. Liu and R. Sundaresan, 2018 56th Annual Allerton Conference on Communication, Control, and Computing (Allerton), Monticello, IL, USA, 2018
- Small-Scale Markets for Bilateral Resource Trading in the Sharing Economy, Xia B., Shakkottai S., Subramanian V., Proceedings - IEEE INFOCOM, 10/08/2018
- Bayesian Learning with Random Arrivals, Le T., Subramanian V., Berry R., IEEE International Symposium on Information Theory - Proceedings, 08/15/2018
- Accurate Learning or Fast Mixing? Dynamic Adaptability of Caching Algorithms, Li J., Shakkottai S., Lui J., Subramanian V., IEEE Journal on Selected Areas in Communications, 06/01/2018
- Provisioning of ad-supported cloud services: The role of competition, Nair J., Subramanian V., Wierman A., Performance Evaluation, 04/01/2018
- Eigenvalues of LRU via a linear algebraic approach, Tang D., Subramanian V., Operations Research Letters, 03/01/2018
- Learning from randomly arriving agents, Le T., Subramanian V., Berry R., 55th Annual Allerton Conference on Communication, Control, and Computing, Allerton 2017, 01/17/2018
- Incentivizing Sharing in Realtime D2D Streaming Networks: A Mean Field Game Perspective, Li J., Bhattacharyya R., Paul S., Shakkottai S., Subramanian V., IEEE/ACM Transactions on Networking, 2/1/2017
• The impact of small-cell bandwidth requirements on strategic operators, Chen C., Berry R., Honig M., Subramanian V., 2017 IEEE International Symposium on Dynamic Spectrum Access Networks, DySPAN 2017, 5/5/2017

**Students Advised**

• Hsu Kao, ECE PHD (admitted 2015)
• Mehrdad Moharrami, ECE PHD (co-advised) (admitted 2014)
• Shih-Tang Su, ECE PHD (admitted 2017)
• Dengwang Tang, ECE PHD (admitted 2016)
• Daniel Vial, ECE PHD (admitted 2015)
• Andrew Wintenberg, ECE PHD (co-advised) (admitted 2018)
Sylvester, Dennis

Website: http://web.eecs.umich.edu/faculty/sylvester/

Research Interests: Low power integrated circuit design, computer-aided design for VLSI.

Recent Publications

- An area-efficient 128-channel spike sorting processor for real-time neural recording with 0.175 m W/Channel in 65-nm CMOS, Do A., Zeinolabedin S., Jeon D., Sylvester D., Kim T., IEEE Transactions on Very Large Scale Integration (VLSI) Systems, 01/01/2019
- Energy Efficient Adiabatic FRAM with 0.99 PJ/Bit Write for IoT Applications, Jeloka S., Wang Z., Xie R., Khanna S., Bartling S., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 10/22/2018
- A 2.2 NEF Neural-Recording Amplifier Using Discrete-Time Parametric Amplification, Jang T., Lim J., Choo K., Nason S., Lee J., Oh S., Jeong S., Chestek C., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 10/22/2018
• A 4 + 2T SRAM for Searching and In-Memory Computing with 0.3-VDDmin, Dong Q., Jeloka S., Saligane M., Kim Y., Kawaminami M., Harada A., Miyoshi S., Yasuda M., Blaauw D., Sylvester D., IEEE Journal of Solid-State Circuits, 04/01/2018
• A 42nJ/conversion on-demand state-of-charge indicator for miniature IoT Li-ion batteries, Jeong J., Jeong S., Sylvester D., Blaauw D., Proceedings of the Asia and South Pacific Design Automation Conference, ASP-DAC, 02/20/2018
• Edge pursuit comparator with application in a 74.1dB SNDR, 20KS/s 15b SAR ADC, Shim M., Jeong S., Myers P., Bang S., Shen J., Kim C., Sylvester D., Blaauw D., Jung W., Proceedings of the Asia and South Pacific Design Automation Conference, ASP-DAC, 02/20/2018
• IRazor: Current-Based Error Detection and Correction Scheme for PVT Variation in 40-nm ARM Cortex-R4 Processor, Zhang Y., Khayatzadeh M., Yang K., Saligane M., Pinckney N., Alioto M., Blaauw D., Sylvester D., IEEE Journal of Solid-State Circuits, 02/01/2018
• A 42 nJ/conversion On-Demand State-of-Charge Indicator for Miniature IoT Li-Ion Batteries, Jeong J., Jeong S., Sylvester D., Blaauw D., Kim C., IEEE Journal of Solid-State Circuits, 01/01/2018
• A Noise Reconfigurable All-Digital Phase-Locked Loop Using a Switched Capacitor-Based Frequency-Locked Loop and a Noise Detector, Jang T., Jeong S., Jeon D., Choo K., Sylvester D., Blaauw D., IEEE Journal of Solid-State Circuits, 01/01/2018
• Always-On 12-nW Acoustic Sensing and Object Recognition Microsystem for Unattended Ground Sensor Nodes, Jeong S., Chen Y., Jang T., Tsai J., Blaauw D., Kim H., Sylvester D., IEEE Journal of Solid-State Circuits, 01/01/2018
• A 0.3V VDDmin 4+2T SRAM for searching and in-memory computing using 55nm DDC technology, Dong Q., Jeloka S., Saligane M., Kim Y., Kawaminami M., Harada A., Miyoshi S., Blaauw D., Sylvester D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017
• A 1.7nW PLL-assisted current injected 32KHz crystal oscillator for IoT, Zeng Y., Jang T., Dong Q., Saligane M., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017
• A 1920 x 1080 30-frames/s 2.3 TOPS/W Stereo-Depth Processor for Energy-Efficient Autonomous Navigation of Micro Aerial Vehicles, Li Z., Dong Q., Saligane M., Kempke B.,


- A 4 + 2T SRAM for Searching and In-Memory Computing With 0.3-V VDDmin, Dong Q., Jeloka S., Saligane M., Kim Y., Kawaminami M., Harada A., Miyoshi S., Yasuda M., Blaauw D., Sylvester D., IEEE Journal of Solid-State Circuits, 12/8/2017

- A 4.7mW switched-bias MEMS microphone preamplifier for ultra-low-power voice interfaces, Oh S., Jang T., Choo K., Blaauw D., Sylvester D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017

- A 42nJ/conversion on-demand state-of-charge indicator for miniature IoT Li-ion batteries, Jeong J., Jeong S., Kim C., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017

- A 6x5x4mm 3 general purpose audio sensor node with a 4.7mW audio processing IC, Cho M., Oh S., Jeong S., Zhang Y., Lee I., Kim Y., Chuo L., Kim D., Dong Q., Chen Y., Lim M., Daneman M., Blaauw D., Sylvester D., Kim H., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017


- A Noise Reconfigurable All-Digital Phase-Locked Loop Using a Switched Capacitor-Based Frequency-Locked Loop and a Noise Detector, Jang T., Jeong S., Jeon D., Choo K., Sylvester D., Blaauw D., IEEE Journal of Solid-State Circuits, 1/1/2018

- A sequence dependent challenge-response PUF using 28nm SRAM 6T bit cell, Jeloka S., Yang K., Orshansky M., Sylvester D., Blaauw D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017

- A start-up boosting circuit with 133x speed gain for 2-transistor voltage reference, Kim D., Jung W., Oh S., Choo K., Sylvester D., Blaauw D., Proceedings of the Custom Integrated Circuits Conference, 7/26/2017


• Exploiting the analog properties of digital circuits for malicious hardware, Yang K., Hicks M., Dong Q., Austin T., Sylvester D., Communications of the ACM, 9/1/2017
• Recryptor: A reconfigurable in-memory cryptographic Cortex-M0 processor for IoT, Zhang Y., Xu L., Yang K., Dong Q., Jeloka S., Blaauw D., Sylvester D., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017

Students Advised

• Hyochan An, ECE PHD (admitted 2017)
• Minchang Cho, ECE PHD (admitted 2015)
• Jeongsup Lee, ECE PHD (admitted 2015)
• Jongyup Lim, ECE PHD (admitted 2016)
• Yimai Peng, ECE PHD (admitted 2018)
• Jihwan Seol, ECE PHD (co-advised) (admitted 2017)
• Jingcheng Wang, ECE PHD (admitted 2014)
• Li Xu, ECE PHD (admitted 2016)
• Qirui Zhang, ECE PHD (admitted 2018)
Terry, Fred

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Research Interests: Electronic properties of materials and their effects on devices; physics of solid state devices.

Recent Publications

- Generation of near-diffraction-limited, high-power supercontinuum from 1.57 mm to 12 mm with cascaded fluoride and chalcogenide fibers, Guo K., Martinez R., Plant G., Maksymiuk L., Janiszewski B., Freeman M., Maynard R., Islam M., Terry F., Bedford R., Gibson R., Chenard F., Chatigny S., Ifarraguaurre A., Applied Optics, 04/01/2018

- Mid-infrared supercontinuum generation from 1.6 to >11 mm using concatenated step-index fluoride and chalcogenide fibers, Martinez R., Plant G., Guo K., Janiszewski B., Freeman M., Maynard R., Islam M., Terry F., Alvarez O., Chenard F., Bedford R., Gibson R., Ifarraguaurre A., Optics Letters, 01/15/2018
Tsang, Leung

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Research Interests: Wave propagation, random media, rough surfaces, electromagnetic theory and computational electromagnetics with applications in environmental remote sensing, signal integrity, electromagnetic compatibility, and photonic crystals.

Recent Publications

• Sea Surface Radar Scattering at L-Band Based on Numerical Solution of Maxwell's Equations in 3-D (NMM3D), Qiao T., Tsang L., Vandemark D., Yueh S., Liao T., Nouguier F., Chapron B., IEEE Transactions on Geoscience and Remote Sensing, 06/01/2018
• Modeling of Scattering in Arbitrary-Shape Waveguide Using Broadband Green's Function with Higher Order Low Wavenumber Extractions, Tsang L., Ding K., Liao T., Huang S., IEEE Transactions on Electromagnetic Compatibility, 02/01/2018
• Broadband point source green's function in a one-dimensional infinite periodic lossless medium based on BBGFL with modal method, Tsang L., Ding K., Tan S., Progress in Electromagnetics Research, 01/01/2018
• 3D Electromagnetic Scattering from Multi-Layer Dielectric media with 2D Random Rough Interfaces Using T-Matrix Approach, Sanamzadeh M., Tsang L., Johnson J., IEEE Transactions on Antennas and Propagation, 01/01/2018

• Electromagnetic scattering and emission by ocean surfaces based on Neighborhood Impedance Boundary Condition (NIBC) with dense grid: Accurate emissivity and sensitivity to salinity, Qiao T., Du Y., Tsang L., Progress In Electromagnetics Research B, 01/01/2018

• Electromagnetic scattering from one dimensional random rough surfaces of dielectric layered media with waveguide modes using second order small perturbation method, Sanamzadeh M., Tsang L., Johnson J., Burkholder R., Tan S., Progress In Electromagnetics Research B, 01/01/2018


• Greens functions, including scatterers, for photonic crystals and metamaterials, Tan S., Tsang L., Journal of the Optical Society of America B: Optical Physics, 11/1/2017

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- Full Wave Modeling and Simulations of the Waveguide Behavior of Printed Circuit Boards Using a Broadband Green's Function, Leung Tsang and Shaowu Huang, US Patent number 9946825, April 17, 2018

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Research Interests: Microwave and millimeter wave remote sensing, radar systems, radio wave propagation.

Recent Publications

- Image Processing For Engineers, Andrew Yagle and Fawwaz Ulaby, Textbook.
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**Research Interests:** Audio and music processing, psychoacoustics, and sound quality engineering

**Recent Publications**

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Research Interests: RF circuits and systems; highly integrated energy- and volume-constrained wireless systems.

Recent Publications

- A 470mW-92.5dBm OOK/FSK Receiver for IEEE 802.11 WiFi LP-WUR, Im J., Kim H., Wentzloff D., ESSCIRC 2018 - IEEE 44th European Solid State Circuits Conference, 10/16/2018
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• Static timing analysis for ring oscillators, Moore D., Fredenburgh J., Faisal M., Wentzloff D., Proceedings: Asia and South Pacific Design Automation Conference, 02/20/2018
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• Circuit and System Designs of Ultra-Low Power Sensor Nodes With Illustration in a Miniaturized GNSS Logger for Position Tracking: Part II—Data Communication, Energy Harvesting, Power Management, and Digital Circuits, T. Jang; G. Kempke; M. B. Henry; N. Chiotellis; C. Pfeiffer; D. Kim; Y. Kim; Z. Foo; H. Kim; A. Grbic; D. Sylvester; H-S. Kim; D. Wentzloff; D. Blaauw, IEEE Transactions on Circuits and Systems I, 1/1/2017
• Circuit and System Designs of Ultra-Low Power Sensor Nodes With Illustration in a Miniaturized GNSS Logger for Position Tracking: Part I—Analog Circuit Techniques, Taekwang Jang; Gyouho Kim; Benjamin Kempke; Michael B. Henry; Nikolaos Chiotellis; Carl Pfeiffer; Dongkwun Kim; Yejoong Kim; Zhiyoong Foo; Hyeongseok Kim; Anthony Grbic; Dennis Sylvester; Hun-Seok Kim; David D. Wentzloff; David Blaauw, IEEE Transactions on Circuits and Systems I, 1/1/2017

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• Ultra-low power long range transceiver, Patent #: 9667294
• Integrated ultra wideband transceiver, Patent #: 9681389
• Ultra-low-power radio for short-range communication, Patent #: 6196299
• Dual-loop programmable and dividerless clock generator for ultra low power applications, Patent #: 9641183

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Research Interests: Laser-driven electron and ion acceleration, relativistic laser propagation through underdense and near-critical density plasmas, laser-driven magnetic reconnection, and proton radiography to study electric and magnetic fields generated during the laser-plasma interactions.

Recent Publications

- Angular streaking of betatron X-rays in a transverse density gradient laser-wakefield accelerator, Ma Y., Seipt D., Dann S., Streeter M., Palmer C., Willingale L., Thomas A., Physics of Plasmas, 11/01/2018
- The unexpected role of evolving longitudinal electric fields in generating energetic electrons in relativistically transparent plasmas, Willingale L., Arefiev A., Williams G., Chen H., Dollar F., Hazi A., Maksimchuk A., Manuel M., Marley E., Nazarov W., Zhao T., Zulick C., New Journal of Physics, 09/01/2018
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Research Interests: Nonlinear optics and photonics; fiber laser laser arrays; nonlinear periodic structures; tunneling time; nanophotonics; semiconductor laser frequency combs.

Recent Publications

- Physics of frequency-modulated comb generation in quantum-well diode lasers, Dong M., Cundiff S., Winful H., Physical Review A, 05/16/2018
- Realization and optimization of phase-shifted distributed feedback fiber Bragg grating Raman lasers, Loranger S., Tehranchi A., Winful H., Kashyap R., Optica, 03/20/2018
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- Frequency comb generation from laser diodes, Dong M., Winful H., Cundiff S., Optics InfoBase Conference Papers, 01/01/2018
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- Subharmonic anti-phase dynamics in coupled mode-locked semiconductor lasers, Sivaramakrishnan S., Winful H., Optics Letters, 12/1/2017
Yoon, Euisik

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Research Interests: Integrated circuits and Microsystems; BioMEMS and lab-on-chips; implantable biomedical sensors; low-power mixed-mode circuits.

Recent Publications

• Morphology-based prediction of cancer cell migration using an artificial neural network and a random decision forest, Zhang Z., Chen L., Humphries B., Brien R., Wicha M., Luker K., Luker G., Chen Y., Yoon E., Integrative Biology (United Kingdom), 12/01/2018
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• Functional Isolation of Tumor-Initiating Cells using Microfluidic-Based Migration Identifies Phosphatidylserine Decarboxylase as a Key Regulator, Chen Y., Humphries B., Brien R., Gibbons A., Qyli T., Haley H., Pirone M., Chiang B., Xiao A., Cheng Y., Luan Y., Zhang Z., Cong J., Luker K., Luker G., Yoon E., Scientific Reports, 12/01/2018
• A Battery-Powered Opto-Electrophysiology Neural Interface with Artifact-Preventing Optical Pulse Shaping, Mendrela A., Park S., Voroslakos M., Flynn M., Yoon E., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 10/22/2018
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- A 272.49 pJ/pixel CMOS image sensor with embedded object detection and bio-inspired 2D optic flow generation for nano-air-vehicle navigation, Lee K., Park S., Cho J., Yoon E., IEEE Symposium on VLSI Circuits, Digest of Technical Papers, 8/10/2017
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Patents Issued
• Neural Probe with Optical Stimulation Capability, E. Yoon, and I.-J. Cho, Patent #: 9642545

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**Recent Publications**

- A 0.23mW Heterogeneous Deep-Learning Processor Supporting Dynamic Execution of Conditional Neural Networks, Wu H., Zhang Z., Papaefthymiou M., ESSCIRC 2018 - IEEE 44th European Solid State Circuits Conference, 10/16/2018
- A 2.56-mm² 718GOPS Configurable Spiking Convolutional Sparse Coding Accelerator in 40-nm CMOS, Liu C., Cho S., Zhang Z., IEEE Journal of Solid-State Circuits, 10/01/2018
- A Maximum-Likelihood Sequence Detection Powered ADC-Based Serial Link, Song S., Choo K., Chen T., Jang S., Flynn M., Zhang Z., IEEE Transactions on Circuits and Systems I: Regular Papers, 07/01/2018
- LEIA: A 2. mm² 140mW lattice encryption instruction accelerator in 40nm CMOS, Song S., Tang W., Chen T., Zhang Z., 2018 IEEE Custom Integrated Circuits Conference, CICC 2018, 05/09/2018
- Post-Processing Methods for Improving Coding Gain in Belief Propagation Decoding of Polar Codes, Sun S., Cho S., Zhang Z., 2017 IEEE Global Communications Conference, GLOBECOM 2017 - Proceedings, 01/10/2018
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• A 5.5GHz 0.84TOPS/mm² neural network engine with stream architecture and resonant clock mesh, Lu S., Zhang Z., Papaefthymiou M., 2016 IEEE Asian Solid-State Circuits Conference, A-SSCC 2016 - Proceedings, 2/6/2017
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• Error patterns in belief propagation decoding of polar codes and their mitigation methods, Sun S., Cho S., Zhang Z., Conference Record - Asilomar Conference on Signals, Systems and Computers, 3/1/2017
Patents Issued

- Iterative detection-decoding system, Z. Zhang and C.-H. Chen, Patent #: 9565581

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Recent Publications


Patents Issued


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