Theses Awarded

S.B.

- **Brian A. Mills** (C. THOMPSON)
  Stress Evolution of RuO_2 Li-ion Thin Film Battery Electrodes (Tentative)

S.M.

- **Aya Amer** (A. CHANDRAKASAN)
  SHARC: Self-healing Analog with RRAM and CNFETs
- **Kwabena Arthur** (G. BARBASTATHIS)
  On the Use of Prior Knowledge in Deep Learning Algorithms
- **Alex Barksdale** (J. HAN)
  Lithium Extraction from Brines Using Ion Concentration Polarization
- **Alan Casallas** (J. LANG)
  Contactless Voltage and Current Estimation Using Signal Processing and Machine Learning
- **Jeffery Bowen Chu** (N. FANG)
  Investigating the Feasibility and Impact of Integrating Wire-arc Additive Manufacturing in Aerospace Tooling Applications
- **Huifeng Du** (N. FANG)
  Finite Element Analysis of Adhesive Contact Interface in Continuous 3D Printing
- **Mingye Gao** (V. BULOVIĆ)
  Application of Graphene in Designing Tunneling Nanoelectromechanical Switches
- **Justin Hou** (L. LIU)
  Strong Coupling between Microwave Photons and Nanomagnet Magnons
- **Muhammad I. Ibrahim** (R. HAN)
  Chip-scale Ambient Quantum Magnetometry via CMOS Integration with Diamond Color Centers
- **Iksung Kang** (G. BARBASTATHIS)
  High-fidelity Inversion at Low-photon Counts Using Deep Learning and Random Phase Modulation
- **Muhammad I. Khan** (R. HAN)
  THzID: A 1.6mm2 Package-less Identification Tag with Backscattering and Beam-steering at 260GHz
- **Peter Li** (V. SZE)
  High-throughput Computation of Shannon Mutual Information on Chip
- **Yujun Lin** (S. HAN)
  Mixed-precision NN Accelerator with Neural-hardware Architecture Search
- **Zhijian Liu** (S. HAN)
  Hardware-efficient Deep Learning for 3D Point Cloud
- **Saurav Maji** (A. CHANDRAKASAN)
  Energy-efficient protocol and hardware for security of implantable devices
- **Alberto Nardi** (K. BERGGREN)
  Novel Field Emission Devices for Vacuum Nanoelectronics and Optoelectronic Applications
- **Nicolo Petrini** (K. BERGGREN)
  Effect of Thermal Conductance on the Performance of Superconducting Nanowires Single Photon Detectors (SNSPDs)
- **Joshua Perozek** (T. PALACIOS)
  Vertical Gallium Nitride Fin Transistors for RF Applications
- **Bidusha Poudyal** (D. BONING)
  Predictive Analysis of Installation and Operational Qualification Issues vs. Process Severity Events
- **Gokul Prasath Rajamanickam** (N. FANG)
  A Multispectral Imaging Method and Device to Detect and Quantify the Presence of Fluid in the Middle Ear to Facilitate the Diagnosis and Triage of Ear Infections
- **Taqiyyah Safi** (L. LIU)
  Tunable Spin-charge Conversion Across the Metal-insulator Transition in Vanadium Dioxide
- **Soumya Sudhakar** (V. SZE)
  Balancing Actuation and Computing Energy in Low-power Motion Planning
- **Hanrul Wang** (S. HAN)
  Efficient Algorithms and Hardware for Natural Language Processing
- **Zoe Wolszon** (D. BONING)
  Improving Predictability of Cell Culture Processes During Biologics Manufacturing Scale-up through Hybrid Modeling
- **Yannan Nellie Wu** (V. SZE)
  A Systematic Approach for Architecture-level Energy Estimation of Accelerator Designs
- **Qingyun Xie** (T. PALACIOS)
  Gallium Nitride Electronics for Cryogenic and High Frequency Applications
- **Mantian Xue** (T. PALACIOS)
  Chemical and Biomedical Sensors Using Two Dimensional Materials
- **Mengyang Yuan** (T. PALACIOS)
  GaN Electronics for High-temperature Applications
- **Ryan Zimmerman** (V. BULOVIĆ)
  Fabrication of Singulated c-Si Solar Cells for Semi-flexible Photovoltaic Modules

M. ENG.

- **David Amirault** (D. BONING)
  Partition WaveNet for Deep Modeling of Automated Material Handling System Traffic
- **Daibo Chen** (J. LANG)
  RF Energy Harvesting Using Carbon Nanotube Components
- **Alan Cheng** (V. SZE)
  Low Power Time-of-flight Imaging for Augmented Reality
- **Lauren Clayberg** (T. PALACIOS)
  Web Element Role Prediction From Visual Information Using A Novel Dataset
- **Qiang Cui** (T. PALACIOS)
  Use of Machine Learning in Radio Frequency Integrated Circuits (RFIC) Development
- **Driss Hafdi** (S. HAN)
  Mixed-precision Architecture for Flexible NeuralNetwork Accelerators
- **Theia Henderson** (V. SZE)
  A Continuous Approach to Information-theoretic Exploration with Range Sensors
- **Nicholas Klugman** (J. LANG)
  Modeling and Design of Magnetic Flux Compression Generators
- **Danielius Kramnik** (R. RAM)
  Scaling Trapped-ion Quantum Computers with CMOS-Integrated State Readout
- **Elizabeth Lee** (L. DANIEL)
  Sensitivity Validation of a Coaxial Probe for a Multilayer Tissue Model, Using Simulation and Phantommeasurements
- **Ayrton Munoz** (T. PALACIOS)
  Development of Vertical Bulk Gallium Nitride Power Devices
- **Allan Sadun** (L. DANIEL)
  Robust Design Algorithms for Silicon Photonics
- **Diana Wofk** (V. SZE)
  Fast and Energy-efficient Monocular Depth Estimation on Embedded Systems

PH.D.

- **Odin Brautigam Achorn** (M. BAWENDI)
  Red-emitting Quantum Dots for Luminescent Solar Concentrators and Displays
- **Akshay Agarwal** (K. BERGGREN)
  Techniques for Enhancing Electron Microscopy
- **Nicha Apichitsopa** (J. VOLDMAN)
  Large-area Cell-tracking Cytometry for Biophysical Measurements of Single Cells
- **Murarka Apoorva** (J. LANG)
  Nanoscale Membranes for Electromechanical Systems
- **Xiaowei Cai** (J. A. DEL ALAMO)
  InGaAs MOSFETs for Logic and RF Applications: Reliability, Scalability and Transport
- **Sam Chevalier** (L. DANIEL)
  Observability Framework for Electrial Power Distribution Networks
- **Andrew Dane** (K. BERGGREN)
  Superconducting Photodetectors, Nanowires and Resonators
- **Mo Deng** (G. BARBASTATHIS)
  Deep Learning with Physical and Power-spectral Priors for Robust Image Inversion
- **Paul Gabrys** (R. MACFARLANE)
  Controlling Structure Across Length Scales with Directed Assembly of Colloidal Nanoparticles
- **Preet Garcha** (A. CHANDRAKASAN)
  Low Power Circuits with Integrated Magnetics for Sensors and Energy Harvesting Systems
- **Henri-Louis Girard** (K. VARANASI)
  Interactions at Interfaces Across Scales: from Adsorption to Adhesion
- **Parker Gould** (M. SCHMIDT)
  An Ultra-low Cost Inductively-coupled Plasma Chemical Vapor Deposition Tool for Micro- and Nanofabrication
- **Bashar Hamza** (S.MANALIS)
  An Optofluidic Platform for Longitudinal Circulating Tumor Cell Studies in Mouse Models of Cancer
- **Eric Calvin Hansen** (M. BAWENDI)
  Low-toxicity, Earth-abundant Nanomaterials for Photoluminescence or Magnetic Resonance
- **Marek Hempel** (T. PALACIOS)
  Applications and Technology of 2D Materials for Micro- and Macroscale Electronics
- **Marek Hempel** (J. KONG)
  Technology and Applications of 2D Materials in Micro- and Macroscale Electronics
- **Mitchell Hsing** (M. SCHMIDT)
  Design, Fabrication, and Characterization of a Compact Magnetron Sputtering System for Micro/Nano Fabrication
- **Zhi Hu** (R. HAN)
  Large-scale Dense On-chip Terahertz Radiator and Receiver Arrays
- **Taehoon Jeong** (H.-S. LEE)
  Secure Analog-to-digital Conversion against Power Side-channel Attack

PH.D. (CONTINUED)

- **Jian-An (Jake) Ke** (J. KONG)
  Guided Etching and Deposition of Transition Metal Dichalcogenides
- **Sami Khan** (K. VARANASI)
  Towards Impacting Electrochemical Phenomena Using Interfacial Engineering
- **Yunjo Kim** (J. KIM)
  Interface engineering for exfoliation and integration of heteroepitaxial III-V films
- **Derek Kita** (J. HU)
  Integrated Photonic Devices for Spectroscopic Chemical Detection
- **Rakesh Kumar** (J. LANG)
  Lifetime Battery Cycle Data for Extreme Operating Conditions
- **Duanhui Li** (J. HU)
  Micro Optics for Micro Hybrid Concentrator Photovoltaics
- **Yuxuan Lin** (T. PALACIOS)
  Infrared Detectors Based on Two-dimensional Materials and Heterostructures
- **Thomas Mahony** (V. BULOVIĆ)
  A Hybrid Approach Towards On-chip Visible Lasers
- **Samantha Ann McBride** (K. VARANASI)
  Controlling Crystallization via Interfacial Engineering: Patterning, Fouling-inhibition, and Nutrient Recovery
- **Jinghui Miao** (C. THOMPSON)
  Lithiation-induced Phase Transitions in Alloying Anodes for Thin Film Lithium-ion Batteries
- **Nicole Susanne Moody** (M. BAWENDI)
  Assessing and Improving the Regulatory Compliance and End-of-life Environmental Impacts of Lead-based Thin-film Photovoltaics
- **James Noraky** (V. SZE)
  Algorithms and Systems for Low Power Time-of-flight Imaging
- **Wei Ouyang** (J. HAN)
  Hierarchical Selective Electrokinetic Concentration: the Universal Next-generation Biomolecule Enrichment Technique for Molecular Diagnostics
- **Peter Santos** (R. MACFARLANE)
  Self-assembling Nanocomposite Tectons for Ordered Superlattices
- **Jose Serralles** (L. DANIEL)
  Inverse Problems and Robust Design Optimization Techniques for Magnetic Resonance Imagers
- **Katherine Emily Shulenberger** (M. BAWENDI)
  Confinement Effects on Multiexciton Dynamics in Semiconductor Nanocrystals
- **Timothy Scott Sinclair** (M. BAWENDI)
  Photophysics of Excitation Collection
- **Max Stockslager** (S. MANALIS)
  Single-cell Mass Measurements for Drug Susceptibility Testing in Cancer
- **Elise Strobach** (E. WANG)
  Optically Transparent, Thermally Insulating and Soundproofing (OTTIS) Aerogel for High-efficiency Window Applications
- **Peter Su** (A. AGARWAL)
  Lead Chalcogenide Thin Film Materials and Processing for Infrared Optical Devices
- **Cong Su** (J. KONG)
  Atomic Engineering: Modification of 2D Materials on the Scale of Single Atoms Using Electron Irradiation
- **Scott Tan** (J. KIM)
  Neuromorphic Computing Systems
- **Carson Teale** (M. SCHMIDT)
  In-situ Depth Monitoring for a Deep Reactive Ion Etcher Using a White Light Interferometer
- **Emily Toomey** (K. BERGGREN)
  Superconducting Nanowire Electronics for Alternative Computing
- **Cheng Wang** (R. HAN)
  Terahertz Wave-molecule Interactions via CMOS Chips: From Comb Gas Sensor with Absolute Specificity to Ultra-stable, Miniaturized Clock
- **Tsui-Wei (Lily) Weng** (L. DANIEL)
  Evaluating Robustness of Deep Neural Networks (tentative)
- **Dan Wu** (J. VOLDMAN)
  Microfluidic and Electronic Detection of Protein Biomarkers
- **Yujia Yang** (K. BERGGREN)
  Nanostructures for Vacuum Optoelectronic Engineering
- **Yang Yang** (Q. HU)
  Terahertz Laser Frequency Combs: Devices and Applications
- **Jason Jungwan Yoo** (M. BAWENDI)
  Developing Highly Efficient Lead Halide Perovskite Solar Cells
- **Di Zhu** (K. BERGGREN)
  Microwave Engineering in Superconducting Nanowires for Single-photon Detection