Austin Xu

CONTACT INFORMATION

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RESEARCH INTERESTS

Preference learning/ranking, reinforcement learning, generative adversarial networks, and active learning. Broadly interested in studying decision making from an interpretable and mathematically grounded perspective.

EDUCATION

Georgia Institute of Technology, Atlanta, GA

Ph.D., Electrical and Computer Engineering **Aug. 2019 – Present**
Concentration: Digital Signal Processing and Machine Learning GPA: 4.0
Advisor: Prof. Mark Davenport

University of Michigan, Ann Arbor, MI

B.S.E, Electrical Engineering, Summa Cum Laude **Sept. 2015 – May 2019**
Concentration: Digital Signal Processing GPA: 3.98

RESEARCH EXPERIENCE

Georgia Institute of Technology, Atlanta, GA
Advisor: Mark Davenport **Aug. 2019 – Present**

- Developing joint ideal point and distance metric estimation algorithms from pairwise comparisons. [Matlab].

University of Michigan, Ann Arbor, MI
Advisor: Laura Balzano **Sept. 2018 – Aug. 2019**

- Investigated effects parameter tuning for the order-weighted L1 (OWL) norm for promoting group sparsity. Results handed off for learning sparse Bradley-Terry judgment weights from pairwise comparison data. [Python].
- Developed algorithm to perform blind sensor calibration for data drawn from time-varying low-rank subspaces. Alternates sensor gain learning via Total Least Squares and subspace estimation via GROUSE. Achieved $< 5\%$ sensor calibration error with good initialization. [Matlab].
- Formulated additive union of subspaces sensor model and blindly estimated sensor gains via orthogonal projection. [Matlab].

Advisor: David Wentzloff **Jan. 2017 – April 2018**

- Automated post-processing and data visualization of received MURS band wireless communication data. Enabled mobile wireless testing without the need to transport laboratory equipment. [Python].
- Characterized supercapacitors discharge rate and response to various current loads (pulsed vs. DC) to assess viability for use in ultra low power wireless sensors. Automated data collection and visualization. [NI LabVIEW].

Advisor: Zhengya Zhang **Aug. 2017 – Dec 2017**

- Conducted literature review of deep learning architectures for semantic image segmentation.
- Automated test process for wireless communication ICs. Interfaced with Salae Digital Logic Analyzer to sample and decode received data. [Python, Matlab].

Advisor: Mark Hammig **Oct 2016 – April 2017**

- Immunized analog radiation detection preamplifier to input detector capacitance, resulting in nearly constant gain and rise time. [OrCAD PSpice]
- Interfaced scintillator and silicon photomultiplier (SiPM) test setup to collect and plot positions of radiation concentration from various emission sources. [Matlab].
- Awarded "Outstanding Research Presentation" award at the annual Undergraduate Research Opportunity Program (UROP) symposium. Selected as one of 100 awardees from a pool of 1000+ undergraduate participants.

Workshops

Gene Golub SIAM Summer School - *Theory and Practice of Deep Learning* **July 2020**
African Institute for Mathematical Sciences (AIMS) — Muizenberg, South Africa

- Selected Participant for the Gene Golub SIAM Summer School

Industry Experience

Sandia National Laboratories - *Undergraduate R&D Intern* **May 2018 - Aug. 2018**
Albuquerque, NM

- Developed features for GUI that communicates to FPGA and imaging array via SpaceWire/RMAP. Implemented modular design that incorporates hardware specific communication and file parsing. Optimized testing workflow for hardware changes, which enabled rapid future hardware prototyping. [C++, Qt Creator].
- Implemented internal image processing algorithm. Quantified algorithm accuracy under fixed point and floating point datatypes to determine hardware implementation viability. [Matlab].

General Motors - *Student Intern* **May 2017 - Aug. 2017**
Warren, MI

- Collaborated with GM and tier 1 supplier to develop and implement supply-chain-wide thermal validation plan for rear view camera coaxial cable. Validation plan was integrated for all future rear view cameras.
- Utilized internal software to de-warp rear view camera images to meet internal and government guidelines. Discovered discrepancy between test vehicle de-warping output and specifications, resulting in re-calibrated software update.

Teaching Experience

Graduate Teaching Assistant - *Georgia Institute of Technology* **Aug. 2019 - Present**
Atlanta, GA

- Individually consulted with 20+ undergraduate students to develop their technical communication skills. Provided constructive feedback on resumes, technical documents, and presentations.
- Interfaced with students during 15 hours of weekly office hours, graded assignments, and assisted with in-class activities.

Instructional Aide - *University of Michigan* **Sept. 2018 - May 2019**
Ann Arbor, MI

- Interacted groups of 20+ undergraduate students during weekly recitation section and office hours. Effectively answered questions, explained concepts, and solved guided practice problems. Achieved an instructor evaluation of 4.7/5.0.
- Managed group of 16 graders. Created weekly grading assignments and rubrics, proofread homework solutions, and enforced grading timeline.
- Created homework and exam problems in collaboration with 18 other staff members. Half of individually created exam problems were used on exams, which was highest rate among IAs.

AWARDS

President's Fellowship | Georgia Institute of Technology	Aug. 2019
Distinguished Academic Achievement Award | University of Michigan	Mar. 2019
Outstanding Service Award, EECS Dept. | University of Michigan	Feb. 2018
EECS Scholar | University of Michigan	Feb. 2018
Eta Kappa Nu Scholarship | University of Michigan	April 2017
James B. Angell Scholar | University of Michigan	Mar. 2017
William J. Branstrom Freshman Prize | University of Michigan	Mar. 2016
Dean's List/University Honors | University of Michigan	All Semesters