

Andrew Chio

✉ achio@uci.edu

🌐 <https://www.ics.uci.edu/~achio>

🌐 <http://www.linkedin.com/in/andrew-chio>

Research Interests

Internet-of-Things, Middleware, Machine Learning, Optimization, Distributed Systems

Education

- 📖 **Ph.D. in Computer Science** Fall 2019 – present
University of California, Irvine
Advisor: Prof. Nalini Venkatasubramanian
GPA: 4.00/4.00
- 📖 **B.S. in Computer Science** Fall 2015 – Spring 2019
University of California, Irvine
Magna Cum Laude – Graduated in top 4% of class
GPA: 3.93/4.00

Research Experience

- 📖 **Graduate Research Assistant** Fall 2019 – present
Distributed Systems Middleware Group, University of California, Irvine
 - NSF SWADE Project: Developed solutions for water infrastructure resilience and interoperability
 - DARPA TIPPERS Project: Privacy-enabled smart building infrastructure
- 📖 **Undergraduate Research Assistant** Fall 2018 – Spring 2019
Distributed Systems Middleware Group, University of California, Irvine
 - DARPA TIPPERS Project: privacy-enabled smart building infrastructure
 - Started development of a human trajectory simulator for IoT smart spaces
 - NAVWAR Trident Warrior 2019: Simulated human trajectories on Navy Ship to evaluate mission-critical and non-mission-critical naval use-cases
- 📖 **SURF-IoT Fellow** Summer 2018
Distributed Systems Middleware, University of California, Irvine
 - Part of the Undergraduate Research Opportunities Program, which offered opportunities to work on research related to the Internet-of-Things
 - Formulated and proposed solution for a mediator placement problem to support adaptive communication in Edge-IoT systems

Research Projects

- 📖 **NSF SWADE: Smart Water Data Exchange**
 - Aims to develop tools to interpret data, identify problems, and take actions in drinking water, wastewater, and stormwater domains
 - Solutions to help support water infrastructure resilience and interoperability
- 📖 **DARPA TIPPERS: Testbed for IoT-based Privacy-Preserving Pervasive Spaces**
 - Part of the Brandeis program, which aims to protect the privacy of individuals in smart spaces.

Class Projects

- 📌 **Causal Reasoning Project** Spring 2021
 - Explored constraint-based causal discovery techniques to find causal relationships between variables relevant in a stormwater domain
- 📌 **Middleware Project** Spring 2020
 - Used Apache Spark to distribute workload of a trajectory simulator across several nodes
- 📌 **Distributed Systems Project** Winter 2020
 - Used a local Hadoop cluster and a cloud Hadoop cluster hosted on Amazon Web Services to run a trajectory simulator
 - Analyzed large numbers of log files using MapReduce
- 📌 **Kaggle: Toxic Comment Classification Challenge** Winter 2020
 - Using Natural Language Processing techniques to identify and classify different levels of toxicity in public forum comments
 - Compared and integrated several ML models to achieve $\sim 95\%$ validation accuracy
- 📌 **Java Bytecode Compiler** Spring 2018
 - Implemented a compiler that parsed a Java Class file and produced x86 Assembly code
 - Optimized the generated code using SSA form and data flow propagation

Teaching Experience

- 📌 **Graduate Teaching Assistant** Spring 2020

Course: Principles of Operating System (*CS 143A*)
Department of Computer Science, University of California, Irvine
- 📌 **Graduate Teaching Assistant** Winter 2020, Winter 2021, Spring 2021

Course: Intermediate Programming (*ICS 33*)
Department of Computer Science, University of California, Irvine
- 📌 **Graduate Teaching Assistant** Fall 2019, Fall 2020

Course: Data Structures Implementation and Analysis (*ICS 46*)
Department of Computer Science, University of California, Irvine
- 📌 **Undergraduate Reader** Fall 2017, Winter 2018, Fall 2018

Course: Data Structures Implementation and Analysis (*ICS 46*)
Department of Computer Science, University of California, Irvine
- 📌 **Undergraduate Learning Assistant** Fall 2018 – Spring 2019

Course: Pre-Calculus (*Math 1B*), Calculus (*Math 2A*, *Math 2B*)
Certified Learning Assistants Program
Department of Mathematics, University of California, Irvine
- 📌 **Undergraduate Learning Assistant** Fall 2017 – Spring 2019

Course: Classical Physics Lab (*Physics 7LC*)
Certified Learning Assistants Program
Department of Physics and Astronomy, University of California, Irvine

Awards

- 📌 **ARCS Foundation Scholar** Fall 2022 – Fall 2024

University of California, Irvine

Awards (continued)

- 📖 **UC National Lab In-Residence Graduate Fellowship** Spring 2022 – Spring 2024
Los Alamos National Laboratory & University of California, Irvine
 - One of seven students to be selected to work with national laboratories
 - Proposal: *Integrating Model and Data-Driven Methods in IoT-enabled Resilient Infrastructure*
 - Mentor: Dr. Russell Bent
- 📖 **Mark Weiser Best Paper Award** Mar 2022
In 20th IEEE International Conference on Pervasive Computing and Communications
- 📖 **Dean's Honor Roll** Fall 2015 – Spring 2019
University of California, Irvine
- 📖 **SURF-IoT Summer Fellowship** Summer 2018
Undergraduate Research Opportunities Program, University of California, Irvine
 - Worked with postdoctoral fellow to formulate and propose solution to mediator placement problem to support adaptive communication in Edge-IoT systems
- 📖 **Most Startup Potential: MediPal** Fall 2016
MedApp Jam, University of California, Irvine
 - Worked in a group of seven people to produce a proof-of-concept iOS application to help doctors introduce and talk about potentially frightening medical procedures with children in a friendlier manner

Skills

- 📖 **Programming:** C/C++, Python, Java, Bash, x86 Assembly, MIPS Assembly, \LaTeX
- 📖 **Tools:** Vim, Jupyter Notebooks, AWS, GNS3, Linux, Windows, Raspberry Pi
- 📖 **Coursework:** Machine Learning and Data Mining, Causal Reasoning, Distributed Systems Middleware, Parallel Computing, Optimization, Applied Cryptography, Graph Algorithms, Computational Geometry, Compilers and Interpreters

Research Publications

- [1] **Andrew Chio**, Daokun Jiang, Peeyush Gupta, Roberto Yus, Georgios Bouloukakis, Sharad Mehrotra, and Nalini Venkatasubramanian. “SmartSPEC: Customizable Smart Space Datasets via Event-driven Simulations”. In: *Proceedings of the 20th International Conference on Pervasive Computing and Communications (PerCom 2022)*. 2022, pp. 1–10. (**Mark Weiser Best Paper Award**).
- [2] **Andrew Chio**, Daokun Jiang, Peeyush Gupta, Roberto Yus, Georgios Bouloukakis, Sharad Mehrotra, and Nalini Venkatasubramanian. “Artifact: SmartSPEC: Customizable Smart Space Datasets via Event-driven Simulations”. In: *Proceedings of the 20th International Conference on Pervasive Computing and Communications (PerCom 2022)*. 2022, pp. 1–2.
- [3] Yiming Lin, Daokun Jiang, Roberto Yus, Georgios Bouloukakis, **Andrew Chio**, Sharad Mehrotra, and Nalini Venkatasubramanian. “LOCATOR: Cleaning Wifi Connectivity Datasets for Semantic Localization”. In: *Proc. VLDB Endow.* 14.3 (Nov. 2020), pp. 329–341. ISSN: 2150-8097.
- [4] **Andrew Chio**, Georgios Bouloukakis, Cheng-Hsin Hsu, Sharad Mehrotra, and Nalini Venkatasubramanian. “Adaptive Mediation for Data Exchange in IoT Systems”. In: *Proceedings of the 18th Workshop on Adaptive and Reflexive Middleware (ARM 2019)*. 2019, pp. 1–6.