

Andy Shih

Contact

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Education

Stanford University
Ph.D. in Computer Science
Concentration: Artificial Intelligence / Machine Learning
Sep 2019 - Present

University of California, Los Angeles
M.S. in Computer Science
Concentration: Artificial Intelligence
Jan 2018 - Jun 2019

University of California, Los Angeles
B.S. in Computer Science, *summa cum laude*
GPA: 3.907
Sep 2014 - Dec 2017

Experience

Research Assistant (PhD Student) (Sep 2019 - Present)
Computer Science Department, Stanford University
Stanford Artificial Intelligence Laboratory: Advisors - Stefano Ermon, Dorsa Sadigh

Research Assistant (Master's Student) (Jan 2018 - Jun 2019)
Computer Science Department, UCLA

Automated Reasoning Group: Advisor - Adnan Darwiche

- Worked on formal verification and explanation of classifiers, using methods from knowledge representation and logic to reason about the behavior of classifiers.
- Developed an algorithm to compile probabilistic graphical models into decision diagrams, with time and space complexity guarantees.
- Developed a technique on learning decision diagrams from Neural Network classifiers.

Software Engineering Intern (Jun 2017 - Sep 2017)

Google, San Francisco

- Designed and built a data validation pipeline for detecting errors in high-volume (100TB) network data.
- Created a customizable notification system automatically triggered by corrupted data, improving response time of resolving errors by 10 times.
- Integrated a dynamic webpage to present filtered validation summaries, reducing time to access results.

Software Engineering Intern (Jun 2016 - Sep 2016)

Qualcomm Research, San Diego

- Designed and implemented a scalable data processing and aggregation framework, as part of a mission control system for drones.
- Introduced a streaming feed feature using Apache Spark, improving latency by 10 times.

Conferences

- **Andy Shih**, Arjun Sawhney, Jovana Kondic, Stefano Ermon, and Dorsa Sadigh. On the critical role of conventions in adaptive Human-AI collaboration. In *Proceedings of the 9th International Conference on Learning Representations (ICLR)*, 2021
- **Andy Shih** and Stefano Ermon. Probabilistic circuits for variational inference in discrete graphical models. In *Advances in Neural Information Processing Systems 33 (NeurIPS)*, 2020
- Weijia Shi, **Andy Shih**, Adnan Darwiche, and Arthur Choi. On tractable representations of binary neural networks. In *Proceedings of the 17th International Conference on Principles of Knowledge Representation and Reasoning (KR)*, 2020
- **Andy Shih**, Guy Van den Broeck, Paul Beame, and Antoine Amarilli. Smoothing structured decomposable circuits. In *Advances in Neural Information Processing Systems 32 (NeurIPS)*, 2019. Spotlight presentation
- **Andy Shih**, Adnan Darwiche, and Arthur Choi. Verifying binarized neural networks by anguin-style learning. In *Proceedings of the 22nd International Conference on Theory and Applications of Satisfiability Testing (SAT)*, 2019
- **Andy Shih**, Arthur Choi, and Adnan Darwiche. Compiling Bayesian network classifiers into decision graphs. In *Proceedings of the 33rd AAAI Conference on Artificial Intelligence (AAAI)*, 2019. Oral presentation
- **Andy Shih**, Arthur Choi, and Adnan Darwiche. Formal verification of Bayesian network classifiers. In *Proceedings of the 9th International Conference on Probabilistic Graphical Models (PGM)*, 2018
- **Andy Shih**, Arthur Choi, and Adnan Darwiche. A symbolic approach to explaining Bayesian network classifiers. In *Proceedings of the 27th International Joint Conference on Artificial Intelligence (IJCAI)*, 2018

Workshops

- Arthur Choi, **Andy Shih**, Anchal Goyanka, and Adnan Darwiche. On symbolically encoding the behavior of random forests. Presented at the 3rd Workshop on Formal Methods for ML-Enabled Autonomous Systems (FoMLAS), 2020
- Arthur Choi, Weijia Shi, **Andy Shih**, and Adnan Darwiche. Compiling neural networks into tractable Boolean circuits. Presented at the AAAI Spring Symposium on Verification of Neural Networks (VNN), 2019

Talks

- NeurIPS 2019: Smoothing Structured Decomposable Circuits
- VNN 2019: Verifying Binarized Neural Networks by Local Automaton Learning
- AAAI 2019: Compiling Bayesian Network Classifiers into Decision Graphs
- PGM 2018: Formal Verification of Bayesian Network Classifiers
- IJCAI 2018: A Symbolic Approach to Explaining Bayesian Network Classifiers

Teaching

- Helped prepare course material for undergraduate (CS 161) and graduate (CS 262A, CS264A) course on Artificial Intelligence, for over 100 students.
- Tutored computer science undergraduates with UPE honor society: 120 hours.
- Taught data structure and algorithms at training sessions for ACM-ICPC.

Others

Awards

- 2019 UCLA Computer Science Outstanding Master's Student Award

Service

- Reviewer - ICML 2020/2021, NeurIPS 2020, ICLR 2021, CoRL 2020
- Coach - Stanford ICPC 2020-2021
- UCLA UPE Officer 2016-2018, Outstanding Chapter Award (1/200 chapters)
- UCLA ACM-ICPC Officer 2016-2018, Student Chapter Excellence Award

Competitions

- ACM-ICPC World Finals 2017 (top 0.7% of contestants (384/53446))
- ACM-ICPC North American Championship 2020
- ACM-ICPC North American Invitational - Silver Medal (2016), Bronze Medal (2017)
- ACM-ICPC Southern California Regionals - 2nd place (2016), 2nd place (2018)
- Google Code Jam 2020 - top 200 worldwide
- Facebook Hacker Cup 2020 - top 200 worldwide
- Bloomberg CodeCon - School Champion (2016, 2018), 11th nationally (2018 Finals)
- Caltech Hackathon 2017 - Best Data-Driven, Best Cloud Machine Learning Project

Music

- Royal Conservatory of Music - Grade 8 Piano
- Royal Conservatory of Music - Grade 8 Violin
- First Violinist - Richmond Delta Youth Orchestra (2013-2014)
- Second Violinist - LA Doctors Symphony Orchestra (2018-2019)
- Second Violinist - Stanford Symphony Orchestra (2019-)