Megan Tjandrasuwita

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Education

Massachusetts Institute of Technology 2022 - Present
Ph.D. in Computer Science
NSF Graduate Research Fellowship Program (GRFP)

California Institute of Technology 2018 - 2022
B.S. in Computer Science, GPA: 4.0/4.0

Research Interests

Neurosymbolic ML frameworks that combine deep learning and symbolic methods, such as compositional / modular neural networks, interpretable ML models, (neural) program synthesis. Applications of ML to robotics, scientific discovery, computational fabrication.

Research Experience

Stanford Network Analysis Project, Stanford Jun 2021 - Jun 2022
Deep Learning Researcher *Advisor: Professor Jure Leskovec*

- Researched neurosymbolic methods for performing human-like concept recognition and reasoning in visual domains.
- Constructed policy architecture of agent that performs unsupervised object discovery and identifies relevant relations between concepts. Integrated recurrence in graph neural network (GNN) architecture to improve agent's long-term reasoning.
- Full-conference paper accepted at *NeurIPS 2022*. Short paper published at *ICML 2022 Beyond Bayes Workshop*.

Machine Learning Group, Caltech Sep 2020 - Jun 2022
Machine Learning Researcher *Advisor: Professor Yisong Yue*

- Employed program synthesis to generate human-interpretable programs that classify animal behavior based on laboratory datasets.
- Resulting programs exceeded accuracy of baseline classifiers, and visualizations of temporal filters were more interpretable to neuroscientists.
- First-authored paper published at the *CVPR 2021 CV4Animals Workshop*.

Experimental Economics and Political Science Lab, Caltech Oct 2019 - Mar 2021
Research Intern *Advisor: Professor John Ledyard*

- Developed intelligent trading agents that simulate human behavior in bid-auction settings using the Individual Evolutionary Learning (IEL) model.
- Full paper on the comparisons between IEL and prior models published as chapter 19, pg. 225-250, in the *Handbook of Experimental Finance*.

Infrared Processing and Analysis Center (IPAC), Caltech Jun 2019 - Aug 2019
Machine Learning Researcher *Advisor: Dr. Peter Capak*

- Applied machine learning algorithms to deconvolve noise from cosmology datasets.
- Successfully removed noise from 4D simulated photometry datasets with 100000 points.
- Wrote a technical report that analyzes the effectiveness of the method through numerical and visual metrics.

Publications

- Tailin Wu, **Megan Tjandrasuwita**, Zhengxuan Wu, Xuelin Yang, Kevin Liu, Rok Sosic, Jure Leskovec. **ZeroC: A Neuro-Symbolic Model for Zero-shot Concept Recognition and Acquisition at Inference Time**. *NeurIPS 2022*, *ICML 2022 Beyond Bayes Workshop.* [*paper*]

- Jennifer J. Sun, **Megan Tjandrasuwita**, Atharva Sehgal, Armando Solar-Lezama, Swarat Chaudhuri, Yisong Yue, Omar Costilla-Reyes. **Neurosymbolic Programming for Science.** *NeurIPS 2022 AI4Science Workshop.* [*paper*]

- **Megan Tjandrasuwita**, Jennifer J. Sun, Ann Kennedy, Swarat Chaudhuri, Yisong Yue. **Interpreting Expert Annotation Differences in Animal Behavior**. *CVPR 2021 CV4Animals Workshop.* [*paper*]

- Jasmina Arifovic, Anil Donmez, John Ledyard, **Megan Tjandrasuwita**. **Individual Evolutionary Learning and Zero-Intelligence in the Continuous Double Auction**. *Handbook of Experimental Finance, Chapter 19, p.225 – p.250, Edward Elgar publishing*

Industry Experience

Oracle - Corporate Architecture Jun 2020 - Sep 2020
Software Engineer Intern

- Applied machine learning algorithms to create a recommendation system that processes purchase requests from Oracle's employees.
- Achieved highly interpretable outputs through its ranking system and had a precision of over 80% on validation examples.

Teaching Experience

Caltech Teaching Assistant Jan 2022 - Jun 2022

- Held office hours, graded problem sets, and prepared lecture notes for graduate-level computer science courses: "Machine Learning and Data Mining" (CS/EE 155) and "Advanced Machine Learning Methods" (CS/EE 159).

Computer Science Instructor in K-12 Education Jan 2022 - Mar 2022

- Designed computer science curricula, prepared lesson plans, and taught students of diverse backgrounds at local high schools partnered with Caltech.

Volunteer Tutor with Caltech Y Rise 2018 - 2022

- Taught local high school students in math and science.

Honors & Awards

NSF Graduate Research Fellowship (GRFP)	2022
MIT Stata Family Presidential Fellowship	2022
Caltech Bhansali Family Prize in Computer Science	2022
Northern California Associates Research Fellowship	2021
Caltech Summer Undergraduate Research Fellowship	2019