MEGAN TJANDRASUWITA

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EDUCATION

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

Massachusetts Institute of Technology   2022 - 2024
M.S. in Computer Science, GPA 5.0/5.0
MIT Stata Family Presidential Fellowship, 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 machine learning (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 neuroscience, cognitive science, and robotics.

RESEARCH EXPERIENCE

Computer-Aided Programming Group   Sep 2022 - Present
Neurosymbolic Machine Learning Researcher   *Advisor: Professor Armando Solar-Lezama*
- Researched learning reusable, modular controllers for robots using a novel training objective.
- Developed ML pipeline involving imitation learning for pretraining neural network modules and reinforcement learning for transferring modules to different structures and tasks.
- Experiments in locomotion and grasping domains demonstrate that the learned modules outperform graph neural network and Transformer baselines in training efficiency.
- Full-conference paper in submission to *ICML 2024*.

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 published 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*.

Publications

- **Megan Tjandrasuwita**, Jie Xu, Armando Solar-Lezama, Wojciech Matusik. **MeMo: Meaningful, Modular Controllers via Noise Injection.** *In submission to ICML 2024.*
- Liane Makatura, Michael Foshey, Bohan Wang, Felix HähnLein, Pingchuan Ma, Bolei Deng, **Megan Tjandrasuwita**, Andrew Spielberg, Crystal Elaine Owens, Peter Yichen Chen, Allan Zhao, Amy Zhu, Wil J Norton, Edward Gu, Joshua Jacob, Yifei Li, Adriana Schulz, Wojciech Matusik. **How Can Large Language Models Help Humans in Design and Manufacturing?** *Harvard Data Science Review 2024.*
- 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.

Honors & Awards

NSF Graduate Research Fellowship (GRFP)	2022
MIT Stata Family Presidential Fellowship	2022
Caltech Bhansali Family Prize in Computer Science	2022