Ria Das

riadas@stanford.edu · https://riadas.github.io

EDUCATION

Stanford University Sept. 2023 - Sept. 2028 (Expected)
Ph.D. in Computer Science (on leave/deferral until Fall 2023).

Massachusetts Institute of Technology Jan. 2021 – May 2022
M.Eng. in Computer Science. GPA: 5.00/5.00.

Massachusetts Institute of Technology Sept. 2017 – June 2021
S.B. in Computer Science and Engineering, S.B. in Mathematics. GPA: 4.96/5.00.
Relevant Coursework: Inference and Information*, Theory of Computation*, Advances in Computer Vision*, Quantum Computing*, Computational Cognitive Science, Software Studio, Abstract Algebra. *Graduate.

RESEARCH EXPERIENCE

Computer-Aided Programming and Computational Cognitive Science Groups (CSAIL) March 2020 – Present
Undergraduate Research Assistant March 2020 – Dec. 2020

- Designed and implemented AUTUMN, a functional reactive programming language for expressing causal dynamics in Atari-style, interactive, time-varying grid worlds. (Julia)
- Developed benchmark suite of AUTUMN programs, called the Causal Inductive Synthesis Corpus (CISC), to evaluate inductive program synthesis algorithms and perform human cognitive experiments.
- Built web interface that allows users to interact with AUTUMN programs in the benchmark suite, as well as write, compile, and run their own AUTUMN programs. (HTML/CSS/JavaScript/Julia)

Graduate Research Assistant Jan. 2021 - Present

- (M.Eng. Thesis) Led the development of a novel, cognitive-inspired program synthesis algorithm capable of synthesizing AUTUMN programs given an observed sequence of grid frames. (Julia)
- Approach based on a new method of combining functional synthesis and automata synthesis to discover (stateless) functional data transformations along with time-varying latent program state.
- Currently thinking about neuro-symbolic and probabilistic extensions to our program learning algorithm.
- (Side Proj.) Briefly paused M.Eng. work to help post-doc run ICML experiments: trained a neural ODE model to predict blood glucose monitoring data and implemented ray marching for an inverse graphics problem.
- PIs: Armando Solar-Lezama, Joshua B. Tenenbaum, Zenna Tavares.

Coley Research Group (MIT Department of Chemical Engineering) April 2021 – June 2021
Undergraduate Research Assistant

- Performed variety of statistical analyses (k-means, hierarchical clustering, etc.) to explain performance of machine learning models that predict enzyme activity given an enzyme-substrate pair. (Python)
- Began exploring whether existing ML models for predicting protein-ligand binding affinity could be transferred to predict enzyme activity.
- PI: Connor W. Coley.

PAPERS

1. **Ria Das**, Joshua B. Tenenbaum, Armando Solar-Lezama, Zenna Tavares. Combining Functional and Automata Synthesis to Discover Causal Reactive Programs. *Principles of Programming Languages (POPL) 2023.* To appear.

2. **Ria Das**, Joshua B. Tenenbaum, Armando Solar-Lezama, Zenna Tavares. Combining Functional and Automata Synthesis to Discover Causal Reactive Programs. *Beyond Bayes: Paths Towards Universal Reasoning Systems Workshop, International Conference on Machine Learning (ICML) 2022.*

3. **Ria Das**, Joshua B. Tenenbaum, Armando Solar-Lezama, Zenna Tavares. Synthesis of Reactive Programs with Structured Latent State. *Advances in Programming Languages and Neurosymbolic Systems (AIPLANS) Workshop* and *Causal Inference and Machine Learning (WHY-21) Workshop, Neural Information Processing Systems (NIPS) 2021.*

4. Samuel Goldman, **Ria Das**, Kevin K. Yang, Connor W. Coley. Machine learning modeling of family wide enzyme-substrate specificity screens. PLoS Computational Biology 18(2): e1009853. https://doi.org/10.1371/journal.pcbi.1009853

5. Zenna Tavares, James Koppel, Xin Zhang, **Ria Das**, Armando Solar-Lezama. A Language for Counterfactual Generative Models. *International Conference on Machine Learning (ICML) 2021*.

6. Zenna Tavares, **Ria Das**, Elizabeth Weeks, Kate S. Lin, Joshua B. Tenenbaum, Armando Solar-Lezama. Causal Inductive Synthesis Corpus. *Computer-Assisted Programming Workshop, Neural Information Processing Systems (NIPS) 2020*.

PRESENTATIONS

1. Causal Inductive Synthesis Corpus.
   Computer-Assisted Programming Workshop Poster Session, NIPS 2020.

2. AUTUMNSYNTH: Synthesis of Reactive Programs with Structured Latent State.
   Advances in Programming Languages and Neurosymbolic Systems (AIPLANS) Workshop Poster Session, NIPS 2021. Causal Inference and Machine Learning (WHY-21) Workshop Poster Session, NIPS 2021.

3. Combining Functional and Automata Synthesis to Discover Causal Reactive Programs. *Beyond Bayes: Paths Towards Universal Reasoning Systems Workshop, ICML 2022.*

PROJECTS

1. A Projection-Based Asymmetric Similarity Measure for Distributional Semantic Models.
   Final Project for 6.804 Computational Cognitive Science (Fall 2018).

2. Experiments in Automatic Gaze Estimation for the Lookit Developmental Research Platform.
   Final Project for 6.869 Advances in Computer Vision (Fall 2019). Co-author: Jack Cook.

AWARDS

NSF Graduate Research Fellowship 2022
3rd Place Team Website, 6.170 Software Studio Competition 2019
Bronze Medalist, Math Prize for Girls (MPfG) Olympiad 2016
Bronze Medalist, Math Prize for Girls (MPfG) Olympiad 2015

INDUSTRY EXPERIENCE

Palantir Technologies Summer 2019
Software Engineering Intern (Frontend)
· Implemented frontend features/fixes using TypeScript/React/Redux.

Optum (UnitedHealth Group) Summer 2018
Software Engineering Intern (Backend)
· Worked on backend code improvements to enhance performance of health data reporting tool, using Python, Java, C, and Scala.

ACTIVITIES

Grader for Theory of Computation (18.404, Fall 2020), Floor Chair for Burton Conner Dorm (C5, 2018), Intramural Sports (Ice Hockey, Unified Hockey, Soccer).