Zilei Shao

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EDUCATION

University of California, Los Angeles — Los Angeles, CA
Ph.D. in Computer Science | Advisor: Guy Van den Broeck — *Sep. 2024 - Present*
Research field: AI/ML; Probabilistic Machine Learning

Harvey Mudd College — Claremont, CA
B.S. in Joint Major of Computer Science and Mathematics | GPA: 3.94/4.0 — *Aug. 2020 - May 2024*

RESEARCH EXPERIENCE

StarAI Lab, Los Angeles, UCLA — May 2024 – Present
Graduate Researcher Advised by Professor Guy Van den Broeck — *Los Angeles, CA*

- Exploring **tractable machine learning** techniques to improve the efficiency and interpretability of probabilistic models.
- Conducting research on the **reasoning abilities of large language models**, analyzing their performance on various logic and reasoning tasks.

Reinforcement Learning for Games, L.A.C.E. Lab, Harvey Mudd College — Jun. 2022 – Jul. 2023
Undergraguate Researcher Supervised by Professor Erin Talvitie — *Claremont, CA*

- Developed and trained **object-level neural networks** for Atari 2600 games using **Python** in MinAtar environment.
- Improved reinforcement learning efficiency by **over 20%** in Atari 2600 games through adapting neural network designs with various **reinforcement learning algorithms**, and designing object filtering algorithms in **C++**.
- Developed range-to-range regression to propagate uncertainty in environment, increasing the performance of a model-based reinforcement learning algorithm Model-based Value Expansion (MVE) by over 100%.

PROFESSIONAL EXPERIENCE

Healthcare ML Solutions, Dasion — Dec. 2022 – Sep. 2023
Machine Learning Intern — *Remote*

- Developed a medical document annotation **web application** with in-line annotation, document classification, and support for various data types, including images.
- Implemented an **auto-labeling** feature using a **supervised learning model** and developed an interactive platform for audio-based preliminary AI consultations.

Department of Computer Science, Harvey Mudd College — Oct. 2021 – May 2024
Grader and Tutor — *Claremont, CA*

- Tutored **70+** juniors in computer science, facilitating comprehension of course materials and after-class Q&A sessions.
- Graded weekly assignments for C++ and Java data structures courses and Python machine learning courses.

POSTER AND PUBLICATIONS

Co-Author: "Bounding-Box Inference for Error-Aware Model-Based Reinforcement Learning," Erin J. Talvitie, **Zilei Shao**, Huiying Li, Jinghan Hu, Jacob Boerma, Rory Zhao, Xintong Wang. *Accepted by Reinforcement Learning Conference, 2024.*

Presenter: "Range-to-Range Regression: Propagating Uncertainty in Environment Model," Zilei Shao, Erin Talvitie (advisor). *Harvey Mudd College Summer CS Talk, 2023.*

Poster: "Range-to-Range Regression: Propagating Uncertainty in Environment Model," Zilei Shao, Erin Talvitie (advisor). *Harvey Mudd College Summer CS Open House, 2023.*

Poster/Presenter: "Use Object-Level Representations to Improve Reinforcement Learning Efficiency in Atari Games," Zilei Shao, Erin Talvitie (advisor). *Harvey Mudd College Research Poster Session, 2022.*