Aditi A. Mavalankar

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EDUCATION

M.S. + Ph.D., Computer Science and Engineering *September 2016 - Ongoing*
University of California, San Diego (UC San Diego), USA.

B.Tech (Honours), Computer Science and Engineering *August 2012 - August 2016*
International Institute of Information Technology (IIIT), Hyderabad, India.

RESEARCH EXPERIENCE

Graduate Student Researcher, UC San Diego *September 2018 - ongoing*
Working on developing algorithms in deep reinforcement learning for generalization and transfer across tasks. My current focus is on achieving this by composing value functions and skills.

Research Assistant, IIIT Hyderabad *July 2014 - May 2016*
Worked with Prof. Kavita Vemuri and Prof. Venkatesh Choppella and other researchers on several projects in cognitive science, programming languages and online education.

INDUSTRY EXPERIENCE

Applied Scientist Intern, Amazon Lab126, Sunnyvale *June 2018 - September 2018*
Worked on a confidential project in the Computer Vision team.

Software Development Engineering Intern, Amazon Lab126, Sunnyvale *June 2017 - September 2017*
Developed the computer vision software pipeline that involved implementing algorithms on human detection, tracking and depth-estimation on real-time video input. (Confidential)

MENTORING EXPERIENCE

Co-organizer, ExploreCSR Google - Workshop for Women in CS *September 2019 - June 2020*
Co-directed ExploreCSR, a Google-sponsored workshop to provide exposure to Computer Science research to women in community colleges. We paired teams of 2-4 students with graduate students at UC San Diego, who provided regular mentorship to their teams on a small project, and helped them connect to the research community within UC San Diego.

Graduate Student Lead, Early Research Scholars Program *September 2016 - June 2018*
Mentored 10 groups of undergraduate students for 2 consecutive years as a part of the Early Research Scholars Program funded by the NSF, and coordinated and managed by Prof. Christine Alvarado.

PUBLICATIONS

Y. Song, **A. Mavalankar**, W. Sun, S. Gao. Provably Efficient Model-based Policy Adaptation. *International Conference on Machine Learning (ICML), 2020.*

A. Mavalankar. Goal-conditioned Batch Reinforcement Learning for Rotation Invariant Locomotion. *BeTR-RL Workshop at International Conference on Learning Representations (ICLR), 2020.*

N.S. Uppara, **A. Mavalankar**, K. Vemuri. Eye tracking in naturalistic badminton play: comparing visual gaze pattern strategy in world-rank and amateur player. *The 7th Workshop on Pervasive Eye Tracking and Mobile Eye-Based Interaction, 2018.*

C. Venkatesh, G. Ahuja, **A. Mavalankar**. How does a program run? A visual model based on Annotating Abstract Syntax Trees. *4th IEEE Conference on Learning and Teaching in Computing and Engineering (LaTiCE), 2016.*

A. Mavalankar, T. Kelkar, C. Venkatesh. Generation of Quizzes and Solutions based on Ontologies - a Case for a Music Problem Generator. *The 7th IEEE International Conference on Technology for Education (T4E), 2015.*

A. Mavalankar, S. Dagar, K. Vemuri. Decoding (un)known opponent's game play, a real-life badminton eye-tracking study. *EuroAsianPacific Joint Conference on Cognitive Science (EAPCogSci), 2015.*

TEACHING EXPERIENCE

UC San Diego

CSE 150B: Introduction to AI (Prof. Sicun Gao) *March 2020 - June 2020*

CSE 291: Topics in Search and Reasoning (Prof. Sicun Gao) *March 2019 - June 2019*

CSE 191: Introduction to CS Research (Prof. Christine Alvarado) *September 2017 - December 2017*

CSE 190: Research Methods (Prof. Christine Alvarado) *September 2016 - December 2016*

IIIT Hyderabad

Artificial Intelligence (Prof. Praveen Paruchuri) *January 2016 - May 2016*

Mathematics III (Prof. Shobha Oruganti) *July 2015 - December 2015*

Mathematics II (Prof. Shobha Oruganti) *January 2015 - May 2015*

Mathematics III (Prof. C. N. Kaul) *July 2014 - December 2014*

RECENT PROJECTS

Reproducing The Option Keyboard: Combining Skills in Reinforcement Learning *Ongoing*

Reproducing the NeurIPS 2019 paper - *The Option Keyboard: Combining Skills in Reinforcement Learning* - by DeepMind. This includes creating the environment, and reproducing the algorithms proposed in the paper, as well as the DQN baseline. The environments are created using OpenAI Gym, and the algorithms and baselines are implemented using PyTorch.

Goal-conditioned batch RL for rotation-invariant locomotion *2019-20*

Proposed a novel method to enable high-dimensional continuous control agents to achieve goal-directed locomotion, by incorporating the agent's symmetries into the learning process using data augmentation and invariance to rotation. The proposed approach outperforms standard RL algorithms such as PPO and SAC, as well as goal-conditioned RL algorithms like HER.

Provably Efficient Model-based Policy Adaptation *2019-20*

Collaborated with researchers from UC San Diego and Microsoft Research to propose a novel model-based policy adaptation algorithm to generate trajectories in unseen target environments, and theoretically proved that they converge to trajectories in the source domain. The proposed approach is highly sample-efficient, while retaining performance across a wide range of continuous control tasks.

SKILLS

Programming languages: Python, C, C++, MATLAB, Javascript

Deep learning toolkits: PyTorch, Tensorflow, MXNet, Keras

Other toolkits/libraries: OpenAI Gym, Mujoco, PyBullet, OpenCV, Caffe, NumPy

RELEVANT COURSEWORK

Machine Learning, Advanced Deep Learning, Statistical Methods in AI, Probabilistic Learning and Reasoning, Recent Advances in Computer Vision, Recommender Systems and Social Networks, Data Analytics, Information Retrieval and Extraction, Scientific Writing, Algorithms

SELECTED ACHIEVEMENTS AND AWARDS

Doctoral Award for Excellence in Contributions to Diversity at UC San Diego *2020*

Masters Award for Excellence in Service/Leadership at UC San Diego *2018*

Research Award at IIIT Hyderabad *2015*

Dean's Award for Academic Excellence at IIIT Hyderabad *2012-2016*