

Aditi A. Mavalankar

amavalan@eng.ucsd.edu • aditimavalankar.github.io
github.com/aditimavalankar • linkedin.com/in/aditimavalankar

EDUCATION

MS + PhD, Computer Science and Engineering *September 2016 - July 2022*

University of California, San Diego (UC San Diego), USA.

Advised by: Lawrence Saul

Thesis Committee: Lawrence Saul, Sanjoy Dasgupta, Tara Javidi, Julian McAuley, Doina Precup

Dissertation: Discovering useful behaviour in reinforcement learning

BTech (Honours), Computer Science and Engineering *August 2012 - August 2016*

International Institute of Information Technology (IIIT), Hyderabad, India.

RESEARCH INTERESTS

Reinforcement Learning

Robotics

Deep Learning

Machine Learning

RESEARCH EXPERIENCE

Research Scientist Intern, DeepMind *May 2022 - September 2022*

Manager: Doina Precup

Collaborators: André Barreto, Diana Borsa, Gheorghe Comanici, Tom Schaul, Zita Marinho

Working on making generalized policy improvement, which is a zero-shot policy composition method, robust to approximation errors to enable decision making in areas of high uncertainty.

Research Scientist Intern, DeepMind *April 2021 - August 2021*

Manager: Doina Precup

Collaborators: André Barreto, David Abel, Diana Borsa, Zach Holland

Worked on devising an approach for discovery of useful behavioral modules that can be combined together by a high-level controller to exhibit complex behaviour. This involved a novel formulation of the problem statement, as well as designing new combinatorial environments for evaluating the approach.

Applied Scientist Intern, Amazon Lab126 *June 2018 - September 2018*

Worked on devising Computer Vision algorithms for Amazon Astro.

Software Development Engineering Intern, Amazon Lab126 *June 2017 - September 2017*

Developed the computer vision pipeline that involved implementing algorithms on human detection, tracking and depth-estimation on real-time video input for Amazon Astro.

Research Assistant, IIIT Hyderabad *July 2014 - May 2016*

Worked on multiple projects in cognitive science, programming languages, and education.

PUBLICATIONS

A. Mavalankar, A. Barreto, D. Abel, D. Borsa, G. Z. Holland, D. Precup. Synthesizing the Option Keyboard: Option Discovery in Reinforcement Learning. *Manuscript under preparation, 2022.*

A. Mavalankar*, G. So*, Y. Ma, S. Dasgupta, D. Precup. Lifelong Exploration in Infinite Graphs. *Manuscript under preparation, 2022.*

V. Gokul, A. Mavalankar, S. Dubnov. The Option-Duet: Synthesizing Music using Options. *Manuscript under preparation, 2022.*

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*, 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.

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

LEADERSHIP AND SERVICE

Co-organizer, ExploreCSR Google *September 2019 - June 2020*
Co-directed *ExploreCSR*, a Google-sponsored workshop to provide exposure to Computer Science research to women in community colleges

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 Christine Alvarado.

TEACHING EXPERIENCE

UC San Diego

CSE 251A: Machine Learning: Learning Algorithms	<i>Winter 2022</i>
CSE 250A: Principles of AI: Probabilistic Reasoning and Decision-Making	<i>Fall 2020, Fall 2021</i>
CSE 251B: Neural Networks and Pattern Recognition	<i>Winter 2021</i>
CSE 150B: Introduction to AI	<i>Spring 2020</i>
CSE 291: Topics in Search and Reasoning	<i>Spring 2019</i>
CSE 191: Introduction to CS Research	<i>Fall 2017</i>
CSE 190: Research Methods	<i>Fall 2016</i>

IIIT Hyderabad

Artificial Intelligence	<i>Spring 2016</i>
Mathematics III	<i>Monsoon 2014, Monsoon 2015</i>
Mathematics II	<i>Spring 2015</i>

TECHNICAL SKILLS

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

Deep learning toolkits: Jax, 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

REFERENCES

Doina Precup

Research Team Lead, DeepMind

Lawrence Saul

Professor, UC San Diego