

Sumedh Pendurkar

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Research Interests / Research Experience

Reinforcement Learning, Reinforcement Learning from Human Feedback (RLHF), Large Language Models, Deep Learning, Combinatorial Optimization

Education

Texas A&M University

[TX, USA](#)

Doctor of Philosophy in Computer Science, 4/4 GPA

August 2019 - May 2025

- *Key courses:* Reinforcement Learning, Applied Bayes Methods, Optimization for Machine Learning, Machine Learning, AI, Analysis of Algorithms, Algorithms for Graph Mining
- *Advisor:* Dr. Guni Sharon

College of Engineering, Pune

[Pune, India](#)

Bachelor of Technology in Computer Engineering, 9.12/10 CGPA

July 2015 - May 2019

- *Key courses:* Data Science, Design and Analysis of Algorithms, AI, Theory of Computation, Introduction to Graph Theory

Work Experience

University of Alberta

[Edmonton, AB, Canada](#)

Visiting Student

May 2023 - July 2023

- Worked on developing curriculum generation methods for various guided state-space search algorithms.
- Proposed approach achieved 5-36 times better performance as compared to the baseline algorithms.
- *Supervisor:* Dr. Nathan Sturtevant and Dr. Levi Lelis

Niantic Inc.

[Sunnyvale, CA, USA](#)

Machine Learning Scientist Intern

May 2022 - Aug 2022

- Worked on game meta balancing methods for various peer vs peer games, such as Pokemon video games
- The work resulted in a publication at AAMAS

Goldman Sachs

[Bangalore, India](#)

Summer Technology Analyst (Intern)

May 2018 - July 2018

- Worked on UI part of a change management tool for business units using Angular 6
- Developed RESTful web services in Java for the change management tool, currently used in production

Indian Institute of Technology (IIT), Roorkee

[Roorkee, India](#)

Visiting Student

May 2017 - July 2017

- Designed deconv-net based model for single image super-resolution on optical satellite images, achieved 0.55 dB PSNR over SOTA. Resulted in a publication at ICIAP.
- Investigated zero-shot techniques for super-resolution of optical satellite images
- *Supervisor:* Dr. Biplab Banerjee

Selected Publications

Exploring the Benefits of Using Maximum-Entropy Objective for Overcoming Negative Transfer in Reinforcement Learning

V. Bajaj, S. Pendurkar, G. Sharon

2024

Under Submission.

Goal Distribution in Conflict-Based Search for Multi-Agent Pathfinding and its Implications to Monte-Carlo Sampling

C. Simpson, S. Pendurkar, G. Sharon

2024

Under Submission.

Curriculum Generation for Learning Guiding Functions in State-Space Search

AB, Canada

Algorithms

S. Pendurkar, L. Lelis, N. Sturtevant, G. Sharon

2024

Symposium on Combinatorial Search (SoCS)

The (Un)Scalability of Informed Heuristic Function Estimation in NP-Hard Search

Problems

S. Pendurkar, T. Huang, B. Juba, J. Zhang, S. Koenig, G. Sharon

2023

Transactions of Machine Learning Research (TMLR)

Bilevel Entropy based Mechanism Design for Balancing Meta in Video Games

London, UK

S. Pendurkar, C. Chow, J. Luo, G. Sharon

2023

International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

Comparison between popular Genetic Algorithm (GA)-based tool and Covariance Matrix Adaptation - Evolutionary Strategy (CMA-ES) for optimizing indoor daylight

China

M. Anis, S. Pendurkar, Y. Yi, G. Sharon

2023

IBPSA International Conference and Exhibition on Building Simulation

The (Un)Scalability of Heuristic Approximators for NP-Hard Search Problems

New Orleans, USA

S. Pendurkar, T. Huang, S. Koenig, G. Sharon

2022

Proceedings of NeurIPS workshop. ICBINB.

A Discussion on the Scalability of Heuristic Approximators

Vienna, Austria

S. Pendurkar, T. Huang, S. Koenig, G. Sharon

2022

Symposium on Combinatorial Search (SoCS) (Extended Abstract)

A Joint Imitation-Reinforcement Learning Framework for Reduced Baseline Regret

Prague, Czech Republic

S. Dey, S. Pendurkar, G. Sharon, JP. Hanna

2021

International Conference on Intelligent Robots and Systems (IROS)

Single Image Super-Resolution for Optical Satellite Scenes Using Deep Deconvolutional Network

Trento, Italy

S. Pendurkar, B. Banerjee, S. Saha, F. Bovolo

2019

International Conference on Image Analysis and Processing (ICIAP)

Semantic Guided Deep Unsupervised Image Segmentation

Trento, Italy

S. Saha, B. Banerjee, S. Sudhakaran, S. Pendurkar

2019

International Conference on Image Analysis and Processing (ICIAP)

Technical Skills

Proficient: Programming	Python, C, Javascript
Intermediate: Programming	Java, C++, SQL
Tools and Libraries	PyTorch, Keras, Git, Angular, GTK, Latex

Other Projects

Autograder for the Deep Reinforcement Learning Course

August 2022 - December 2023

- Developed and designed test cases for CSCE 642 Course at Texas A&M University.
- The autograder is being also used by other universities.

Sampling an action from a Q function in continuous action spaces

August 2021 - May 2022

- Investigating various sampling techniques, to efficiently sample actions from the Q function which would resemble Boltzmann sampling in discrete space
- Proposed method would enable agents to have better exploration than SOTA algorithms like Deep Deterministic Policy Gradient, and would not have any assumptions on distribution like Soft-Actor Critic
- *Advisors:* Dr. Guni Sharon

Light-Regularized-GANs for low light images

September 2019 - Jan 2021

- Added an intensity based regularisation to LightEnhancementGAN, to control the intensity of light added to the image without any external supervision

Open-Ended Visual Question Answering System

April 2018 - May 2019

- Designed an attention based multi-modal fusion model which gives a free flowing answer to a question based on video

Word completion feature for GNU-Nano text editor

July 2016 - December 2016

- Authored a word-completion feature which completes the current word based on the text present in the open file
- This feature was incorporated in GNU-Nano, an open source project

Communication/on-board controller system for pico satellite

April 2016 - July 2018

- Developed shared memory protocols for two asynchronous controllers for on-board data sharing on a pico-satellite
- Worked on interfacing various peripherals with on-board controllers for data collection

Honors & Awards

2020 **First Place**, 2020 TAMIDS Data Science Competition

TX, USA

2018 **Deloitte Innovation Award**, Ministry of Road and Railways, Smart India Hackathon

Nagpur, India

2018 **Finalist (40/1980)**, Philips Hackathon on Data Science

Bangalore, India

2013 **Scholarship Holder**, National Talent Search Exam (NTSE), awarded to top 1000 students in India

India

Professional Activities

2020 **Reviewer**, ICRA 2021

2021 **Reviewer**, IROS 2021

2022 **Program Committee**, AAAI 2023, AAAI workshop on multi-agent path finding

2023 **Program Committee**, NeurIPS 2023, AAAI 2023, NeurIPS workshop 2023

2023 **Student Volunteer**, AAMAS 2023

2024 **Program Committee**, ICML 2024, TMLR 2024, AAAI 2024