

# Sumedh Pendurkar

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## Research Interests

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Reinforcement Learning, Heuristic Search, Combinatorial Optimization, AI

## Education

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### 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

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### 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

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### Defining and Achieving an “Appropriate” Curriculum in Reinforcement Learning

V. Bajaj, S. Pendurkar, G. Sharon

2023

Under Submission.

### Curriculum Generation for Learning Guiding Functions in State-Space Search Algorithms

[AB, Canada](#)

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**

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

International Conference on Autonomous Agents and Multiagent Systems (AAMAS)

*London, UK*

2023

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

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

IBPSA International Conference and Exhibition on Building Simulation

*China*

2023

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

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

Proceedings of NeurIPS workshop. ICBINB.

*New Orleans, USA*

2022

## **A Discussion on the Scalability of Heuristic Approximators**

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

Symposium on Combinatorial Search (SoCS) (Extended Abstract)

*Vienna, Austria*

2022

## **A Joint Imitation-Reinforcement Learning Framework for Reduced Baseline Regret**

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

International Conference on Intelligent Robots and Systems (IROS)

*Prague, Czech Republic*

2021

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

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

International Conference on Image Analysis and Processing (ICIAP)

*Trento, Italy*

2019

## **Semantic Guided Deep Unsupervised Image Segmentation**

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

International Conference on Image Analysis and Processing (ICIAP)

*Trento, Italy*

2019

## **Technical Skills**

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

## **Other Projects**

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### **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

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2020	<b>First Place</b> , 2020 TAMIDS Data Science Competition	<i>TX, USA</i>
2018	<b>Deloitte Innovation Award</b> , Ministry of Road and Railways, Smart India Hackathon	<i>Nagpur, India</i>
2018	<b>Finalist (40/1980)</b> , Philips Hackathon on Data Science	<i>Bangalore, India</i>
2013	<b>Scholarship Holder</b> , National Talent Search Exam (NTSE), awarded to top 1000 students in India	<i>India</i>

## Professional Activities

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2020	<b>Reviewer</b> , ICRA 2021
2021	<b>Reviewer</b> , IROS 2021
2022	<b>Program Committee</b> , AAAI 2023, AAAI workshop on multi-agent path finding
2023	<b>Program Committee</b> , NeurIPS 2023, AAAI 2023, NeurIPS workshop 2023
2023	<b>Student Volunteer</b> , AAMAS 2023
2024	<b>Program Committee</b> , ICML 2024, TMLR 2024, AAAI 2024