

# Sumedh Pendurkar

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## Research Interests

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Reinforcement Learning, Machine Learning

## Education

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### Texas A&M University

[TX, USA](#)

Doctor of Philosophy in Computer Science, 4/4 GPA

September 2019 - Present

- *Key courses:* Reinforcement Learning, Applied Bayes Methods, 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, 9.13/10 CGPA

July 2015 - May 2019

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

## Selected Publications

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

[Prague, Czech Republic](#)

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

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)*

## Research Experience

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### Indian Institute of Technology (IIT), Roorkee

[Roorkee, India](#)

Research Intern

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
- Investigated zero-shot techniques for super-resolution of optical satellite images
- *Advisor:* Dr. Biplab Banerjee

## Professional Experience

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### 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

## Technical Skills

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**Programming** Python, C, Javascript

**Tools and Libraries** PyTorch, Keras, Git, Angular, GTK, Latex

## Projects

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### Sampling an action from a Q function in continuous action spaces

August 2021 - Present

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

### Learning heuristic function for large search problems

September 2020 - Present

- Proposed a deep value iteration based method to learn the optimal heuristic function for search problems with large state spaces
- Proposed method starts with a admissible heuristic with greedy search gradually shifting to learnt heuristic function leading to optimal costs and faster searches on tile, pancake puzzles
- *Advisors:* Dr. Guni Sharon, Dr. Sven Koenig

### Gradient free optimization for expensive evaluation functions

June 2020 - Present

- Investigating deep Bayesian optimization techniques for optimization problems where the evaluation function is expensive, and gradients are not available
- Currently looking into neural network and regularization as approximation to deep Gaussian process, and its effects on exploration/exploitation
- *Advisor:* Dr. Guni Sharon

### Light-Regularized-GANs for low light images

September 2019 - January 2021

- Adding 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 as it attends to both, question words and video while outputting every single word of answer

### 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 **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

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2020 **Reviewer**, ICRA 2021

2021 **Reviewer**, IROS 2021