

Atharv Sonwane

🐙 [threewisemonkeys-as.github.io](https://github.com/threewisemonkeys-as) | 🐙 [threewisemonkeys-as](https://github.com/threewisemonkeys-as)

☎ +91 8237441175 | @ atharvs.twm@gmail.com | in [linkedin.com/in/atharv-sonwane](https://www.linkedin.com/in/atharv-sonwane)

RESEARCH INTERESTS

★ Reinforcement Learning ★ Robotics ★ Neurosymbolic AI ★ Meta Learning ★ Autonomous Navigation
★ Cognitive Science ★ Program Synthesis ★ Automata Theory ★ Hierarchical Learning ★ Distributed Systems

EDUCATION

★ **Birla Institute of Technology and Science, Pilani** Aug. 2018 - Present
Bachelor in Engineering (Hons.), Computer Science. CGPA = 8.68 / 10 *Goa, India*

TECHNICAL SKILLS

Programming C/C++, Python, Java, Rust, MATLAB, SQL, OCaml, Bash
Deep Learning PyTorch, Tensorflow, Keras, NumPy, JAX, scikit-learn, pandas, Matplotlib
Robotics Robot Operating System (ROS), rViz, Gazebo, MAVROS, PX4, Raspberry Pi
Tools Git, L^AT_EX, Unix, TravisCI, AutoCAD, Qiskit

EXPERIENCE

- ★ **APP Centre for Artificial Intelligence Research & TCS Research** | [WEB](#) *Jan 2021 - Current*
Undergraduate Researcher | Advisors: [Prof Ashwin Srinivasan](#) and [Dr. Gautam Shroff](#)
▷ Currently working on Bayesian Neural Program Synthesis and its applications to visual reasoning tasks
▷ Contributing to project on automata augmented Deep Reinforcement Learning
- ★ **Centre of Robotics and Machine Intelligence IIIT Allahabad** | [WEB](#) *Summer 2020*
Research Intern | Advisor: [Prof G.C. Nandi](#)
▷ Explored how Deep Reinforcement Learning algorithms can be used for robotics in a simulated setting
▷ Implemented and tested performance of various algorithms from scratch in PyTorch
- ★ **Council of Scientific and Industrial Research - CERRI** | [WEB](#) | [CODE](#) *Summer 2020*
Research Intern | Advisors: [Samarth Singh](#) and [Dr. Rakesh Warier](#)
▷ Applied Deep Q learning to navigation of autonomous quadcopters. A live depth-map feed was taken as input to generate movement commands for the drone
▷ Built a controller on top of the MAVROS framework and simulated the learning process using PX4 and PX4 SITL.
- ★ **Digital Communications Lab, BITS Goa** *Jan 2020 – April 2020*
Undergraduate Researcher | Advisors: Abhijit Dey and [Dr. Nitin Sharma](#)
▷ Analysis and forecasting of GNSS (Global Navigation Satellite System) signals to learn more about disturbances due to ionospheric activity using Deep Learning
▷ Implemented LSTM based models in TensorFlow for both prediction and classification of ionospheric time series data

PROJECTS

- ★ **GenRL | PyTorch Reinforcement Learning Library** | [CODE](#) *June 2020 – Present*
Society for Artificial Intelligence and Deep Learning (SAiDL)
▷ Collection of SOTA algorithms in Deep and Classical RL along with various utilities
▷ Contributed implementations of various Deep Contextual Bandits
▷ Core Maintainer and currently working on implementation of distributed RL using RPC

- ★ **Trotbot | Autonomous Delivery Robot | [CODE](#)** *Sep 2018 – Present*
Electronics and Robotics Club, BITS Goa ([ERC](#))
 - ▷ Built obstacle detection and path planning stack using Robot Operating System (ROS) in Python
 - ▷ Implemented Rapidly Exploring Random Trees (RRT) for path planning in complex indoor environments
- ★ **Structure and Inductive Biases in Reinforcement Learning | [CODE](#)** *July 2020 – Dec 2020*
 - ▷ Investigating how inductive biases are incorporated in various ML algorithms
 - ▷ Implemented methods which used graph representations in RL to explore structural inductive bias
- ★ **GenNav | Python library for Robotics Navigation | [CODE](#)** *March 2020 – Present*
Electronics and Robotics Club, BITS Goa ([ERC](#))
 - ▷ Co-author and Lead Maintainer working with a team of 10+ student contributors
 - ▷ Modular collection of navigation algorithms and broad range utilities commonly used in Robotics with unified API
 - ▷ Developing a ROS wrapper to enable easy integration into real world robotics systems
- ★ **Causality in Reinforcement Learning | [CODE](#)** *July 2020 – September 2020*
 - ▷ Experimentation with integrating causal factors in RL algorithms for better performance in medical settings.
- ★ **Oneshot Classification using Transfer Learning | [CODE](#)** *Aug 2019*
 - ▷ Used transfer learning techniques to improve performance of a Siamese network for one shot learning on the Omniglot dataset.
- ★ **Deep Q Learning for Atari Environments | [CODE](#)** *Aug 2019*
 - ▷ Experimented with using Double DQN algorithm to play Pong and Pacman gym environments.
- ★ **Spoken Digit Classification | [CODE](#)** *Dec 2019*
 - ▷ Trained a CNN to classify audio clips of spoken digits encoded with a Short Time Fourier transform.
- ★ **Robotic Sketcher | [WEB](#)** *Jan 2020*
 - ▷ Created an automated sketching machine to produce visually appealing sketches from images as a display.

TEACHING AND LEADERSHIP ROLES

- ★ **Teaching Assistant - Machine Learning (BITS F464)** *Jan 2021 – Present*
 - ▷ Conducting weekly labs on implementation of machine learning algorithms, working under Prof Tirtharaj Dash and Prof Ashwin Srinivasan
 - ▷ Responsible for organising the course project component
- ★ **Teaching Assistant - Discrete Structures for Computer Science (CS F222)** *Aug 2020 – Dec 2020*
 - ▷ Mentored undergraduate students in weekly problem solving sessions for course taught by Prof AB Matthews
- ★ **Student Coordinator - Electronics and Robotics Club | [WEB](#)** *Aug 2020 – Present*
 - ▷ Leading a large (100+) group of undergraduates interested in Robotics. Organising research projects, funding, work exhibitions and holding regular discussion sessions
- ★ **Member - Society for Artificial Intelligence and Deep Learning | [WEB](#)** *Aug 2020 – Present*
 - ▷ Involved in research projects, teaching introductory courses, and discussion sessions on AI and deep learning
- ★ **Instructor for Student Run Courses** *April 2020 – Dec 2020*
 - ▷ Mentored and created reference material for introductory courses in Robotics and Deep Learning
- ★ **Committee Member - SandBox Innovation Laboratory | [WEB](#)** *Aug 2020 – Present*

RELEVANT COURSES

Meta Learning^{#*}, Machine Learning, Artificial Intelligence^{*}, Probability and Statistics, Graphs and Networks, Theory of Computation, Data Structures and Algorithms, Linear Algebra, Calculus, Operating Systems, Object Oriented Programming, Computational Physics, Quantum Informatics and Computing, Convolutional Neural Networks for Visual Recognition[†] (Stanford CS231n), Deep Reinforcement Learning[†] (UC Berkeley CS285)

= graduate level, * = ongoing, † = online