

Atharv Sonwane

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

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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** 2018 - 2022 (*Expected*)
Bachelor in Engineering (Hons.), Computer Science. CGPA = 8.76 / 10 Goa, India

TECHNICAL SKILLS

Programming	C/C++, Python, Julia, Java, MATLAB, SQL, 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, \LaTeX , Unix, TravisCI, AutoCAD, Qiskit

PUBLICATIONS

★ Sharad Chitlangia*, **Atharv Sonwane***, Tirtharaj Dash, Lovekesh Vig, Gautam Shroff, Ashwin Srinivasan.
Using Program Synthesis and Inductive Logic Programming to solve Bongard Problems. **Under Review.**

EXPERIENCE

- ★ **TCS Research & Innovation** June 2021 - Aug 2021
Research Intern | Primary Advisor: [Dr. Gautam Shroff](#)
▷ Explored how a neural algorithmic approach can be used to perform analogy identification in a visual domain.
- ★ **APP Centre for Artificial Intelligence Research & TCS Research** | [WEB](#) Jan 2021 - June 2021
Undergraduate Researcher | Primary Advisor: [Prof Ashwin Srinivasan](#)
▷ Adapting Bayesian Neural Program Synthesis with Inductive Logic Programming for visual reasoning tasks
▷ Contributed to a project on automaton augmented reinforcement learning
- ★ **Centre of Robotics and Machine Intelligence IIIT Allahabad** | [WEB](#) Summer 2020
Research Intern | Advisor: [Prof G.C. Nandi](#)
▷ Implemented and tested performance of various Deep RL 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](#)
▷ Built a drone controller module and OpenAI Gym Environment on top of the MAVROS and PX4 frameworks
- ★ **Digital Communications Lab, BITS Goa** Jan 2020 - April 2020
Undergraduate Researcher | Advisors: Abhijit Dey and [Dr. Nitin Sharma](#)
▷ Implemented LSTM based models in TensorFlow for both forecasting and classification tasks on time series data based on ionospheric activity relevant to GNSS (Global Navigation Satellite System) signals

SELECTED PROJECTS

- ★ **GenRL | PyTorch Reinforcement Learning Library** | [CODE](#) *June 2020 – Jan 2021*
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 worked on implementation of distributed RL using RPC
- ★ **Trotbot | Autonomous Delivery Robot** | [CODE](#) *Sep 2018 – Dec 2020*
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
- ★ **GenNav | Python library for Robotics Navigation** | [CODE](#) *March 2020 – Dec 2020*
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
 - ▷ Developed a ROS wrapper to enable easy integration into real world robotics systems
- ★ **Causal Reasoning from Meta-Reinforcement Learning Exploration** | [CODE](#) *March 2021 – May 2021*
Meta Learning Course Project
 - ▷ Implemented methods described in the paper and reproduced results on various experiments.
 - ▷ Devised, performed and documented additional experiments to further evaluate the central claim that Meta RL agents can perform Causal Inference.
- ★ **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

TEACHING AND LEADERSHIP ROLES

- ★ **Teaching Assistant - Deep Learning (CS F425)** | [WEB](#) *Aug 2021 – Present*
 - ▷ Conducting weekly labs and tutorials for course taught by Prof Tirtharaj Dash
- ★ **Teaching Assistant - Machine Learning (BITS F464)** | [WEB](#) *Jan 2021 – May 2021*
 - ▷ Conducted weekly labs and organised course project for course taught by Prof Ashwin Srinivasan
- ★ **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
- ★ **President - Society for Artificial Intelligence and Deep Learning** | [WEB](#) *June 2021 – Present*
 - ▷ Organising research and open-source projects, and holding regular reading sessions for a group (30) of talented undergraduates interested in AI
- ★ **Student Coordinator - Electronics and Robotics Club** | [WEB](#) *Aug 2020 – July 2021*
 - ▷ Organising research projects, funding, work exhibitions and holding regular discussion sessions for a large (100+) group of undergraduates interested in Robotics
- ★ **Instructor for Student Run Courses on Robotics and Deep Learning** *April 2020 – Dec 2020*
- ★ **Committee Member - SandBox Innovation Laboratory** | [WEB](#) *Aug 2020 – Aug 2021*

RELEVANT COURSEWORK

Meta Learning^{#*}, Machine Learning^{*}, Artificial Intelligence, Linguistics, 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, * = ranked top 2 students, † = online