

Atharv Sonwane

Research Fellow, Microsoft Research

🐙 [threewisemonkeys-as.github.io](https://github.com/threewisemonkeys-as) | 🐙 [threewisemonkeys-as](https://github.com/threewisemonkeys-as) | Google Scholar | @ atharvs.twm@gmail.com | [in linkedin.com/in/atharv-sonwane](https://www.linkedin.com/in/atharv-sonwane)

Research Interests: *Planning & Reasoning, LMs for Code (Generation/Maintenance/Verification), Robotics*

EDUCATION

Birla Institute of Technology and Science, Pilani

2018 - 2022

Bachelor in Engineering, Computer Science.

India

EXPERIENCE

Microsoft Research India

Aug 2022 - Present

Research Fellow | Advisors: [Dr. Aditya Kanade](#) and [Dr. Sriram Rajamani](#)

- Machine learning and program analysis for software engineering tasks.
- Developed **CodePlan**: a framework for repository-level code tasks that does *planning* and *reasoning* using LLMs and program analysis. Poster at **FMDM at NeurIPS '23**. Under submission at **FSE '24**
- Studied evaluation and ranking of LLM generated rewrites for code-quality issues. Under submission at **FSE '24**

Robot Vision and Learning Lab, University of Toronto

Sept 2021 - Jan 2022

Research Intern | Advisor: [Dr. Florian Shkurti](#)

- Designed and implemented a novel combination of lazy search and learning from experience to tackle task and motion planning (TAMP) problems for tabletop robotics tasks. Published at **ICRA '23**.

TCS Research & Innovation

June 2021 - Sept 2021

Research Intern | Advisor: [Dr. Gautam Shroff](#)

- Studied neuro-symbolic combination of representation learning and search to perform analogical reasoning with images by finding neural programs that represent the analogical concept. Student Poster **AAAI '21, NeSy '21**.

APP Centre for Artificial Intelligence Research

Jan 2021 - June 2021

Undergraduate Researcher | Advisor: [Prof Ashwin Srinivasan](#)

- Developed a novel approach to solve visual reasoning (Bongard) problems using program synthesis (Dreamcoder) for representation and Inductive Logic Programming (ILP) for concept identification. **AAIP '21**

PUBLICATIONS

CodePlan: Repository-level Coding using LLMs and Planning

*Ramakrishna Bairi, **Atharv Sonwane**, Aditya Kanade, Vageesh D C, Arun Iyer, Suresh Parthasarathy, Sriram Rajamani, B. Ashok, Shashank Shet*

Under submissions at the Symposium on the Foundations of Software Engineering (**FSE**) 2024. [Link](#).

Accepted at the Foundation Models for Decision Making (**FMDM**) Workshop at **NeurIPS 2023**

Policy-Guided Lazy Search with Feedback for Task and Motion Planning

*Mohamed Khodeir, **Atharv Sonwane**, Ruthrash Hari, Florian Shkurti*

International Conference on Robotics and Automation (**ICRA**). 2023. [Link](#).

Best Paper Award at the Long-Horizon Planning Workshop, **CoRL 2022**

Neural Analogical Reasoning

***Atharv Sonwane**, Abhinav Lalwani, Sweta Mahajan, Gautam Shroff, Lovekesh Vig*

International Workshop on Neural-Symbolic Learning and Reasoning (**NeSy**). 2022. [Link](#).

Solving Visual Analogies Using Neural Algorithmic Reasoning

***Atharv Sonwane**, Gautam Shroff, Lovekesh Vig, Ashwin Srinivasan, Tirtharaj Dash.*

Finalist in the Oral Presentation Competition. Student Abstract and Poster Program, **AAAI-22**. [Link](#).

Using Program Synthesis and Inductive Logic Programming to solve Bongard Problems.

Atharv Sonwane*, Sharad Chitlangia*, Tirtharaj Dash, Lovekesh Vig, Gautam Shroff, Ashwin Srinivasan.

International Workshop on Approaches and Applications of Inductive Programming (AAIP) 2021. [Link](#).

Frustrated with Code Quality Issues? LLMs can Help!

Nalin Wadhwa, Jui Pradhan, **Atharv Sonwane**, Surya Prakash Sahu, Nagarajan Natarajan, Aditya Kanade, Suresh Parthasarathy, Sriram Rajamani

Under submissions at the Symposium on the Foundations of Software Engineering (FSE) 2024. [Link](#).

SELECTED ENGINEERING PROJECTS

AutoFill.jl | Julia library for data manipulation | [CODE](#)

Implemented FlashFill program synthesis for tabular data analysis during Google Summer of Code (GSoC) 2022

GenRL | PyTorch Reinforcement Learning Library | [CODE](#)

Contributed implementations of Deep Contextual Bandits along with distributed RL support using RPC.

Trotbot | Autonomous Delivery Robot | [CODE](#)

Built stack for obstacle detection and path planning with RRT variants using Robot Operating System (ROS).

GenNav | Python library for Robotics Navigation | [CODE](#)

Implemented navigation algorithms and utilities commonly used in Robotics with a ROS wrapper

OTHER ROLES

Reviewing

- FMDM Workshop @ NeurIPS 2023

Teaching

- Meta Learning ([BITS G513](#)): Conducted tutorials for graduate level course taught by Dr Gautam Shroff
- Deep Learning ([CS F425](#)): Conducted weekly labs and tutorials for first instance of the course.
- Machine Learning ([BITS F464](#)): Conducted weekly labs and organised final project for course taught by Prof Ashwin Srinivasan
- Discrete Structures for Computer Science (CS F222): Mentored undergraduate students in weekly tutorials.
- Instructor for Student Run Courses on [Robotics](#) and Deep Learning

Leadership

- Hardware Lead @ [Curem Biotech](#): Designed and wrote firmware for blood sample imaging device with ML integration. Raised pre-seed funding worth \$10,000 for diagnosis of Neglected Tropical Diseases
- Lead Organiser of [APPCAIR AI Symposium 2021](#): Organised an event with 500+ attendees aimed at bringing together the AI community in India.
- President of the [Society for Artificial Intelligence and Deep Learning](#): Organising research, open-source projects and student-run courses for a group of undergraduates interested in AI.
- Student Coordinator of the [Electronics and Robotics Club](#): Organising research, funding and discussion sessions for 100+ undergraduates interested in Robotics.

RELEVANT COURSEWORK

Meta Learning (*graduate level, ranked first*), **Machine Learning** (*ranked second*), **Artificial Intelligence**.

TECHNICAL SKILLS

Programming Python, Julia, C/C++, MATLAB, SQL, Bash

Deep Learning PyTorch, NumPy, JAX, pandas, scikit-learn

Robotics Robot Operating System (ROS), Gazebo, MAVROS, PX4