

Manav Singhal

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EDUCATION

National Institute of Technology Karnataka

B.Tech in Electrical and Electronics (Minor in Computer Science).

Surathkal, India

July 2018 – July 2022

- GPA: **9.03/10.00**

INDUSTRY EXPERIENCE

Microsoft Research India

July 2022 - Present

Research Fellow. Mentors: [Nagarajan Natarajan](#) and [Aditya Kanade](#)

- Developed benchmarks and evaluation methodologies for code generation with Large Language Models (LLMs), focusing on evaluation of non-functional requirements of the generated code.
- Extensively evaluated twenty-two code LMs to discover they falter on our benchmark and don't sufficiently comprehend code they can otherwise edit. [[Code](#)]
- Building a capable coding LM to better comprehend and edit code.

Research Fellow. Mentors: [Nishanth Chandran](#), [Divya Gupta](#) and [Dimitrios Dimitriadis](#)

- Led efforts to enhance the accuracy of global model trained in a challenging one-shot federated learning setup with clients trained on non-IID data.
- Achieved over 5% increase in accuracy compared to baselines in our most non-IID setting by combining client logits and encoder output from a pre-trained autoencoder.

Microsoft Research NYC

May 2021 - Sept 2021

Independent Research Developer. Mentors: [Pavithra Srinath](#) and [Olga Vrousseau](#)

- Achieved competitive performance between the public model without access to the user feature mapping and the private model with access in our analysis of our privacy-preserving feature in the [VowpalWabbit](#) library.
- Implemented two different approaches for the feature and compared the existing benchmarks performances of each, released in [VW-9.0.0](#). [[Slides](#)], [[Code](#)], [[Wiki](#)]

PUBLICATIONS

NoFunEval: Funny How Code LMs Falter on Requirements Beyond Functional Correctness

Manav Singhal, Tushar Agarwal, Abhijeet Awasthi, Nagarajan Natarajan, Aditya Kanade

Under Review at ICML.

Fed-Encoder: A One-Shot Federated Learning Solution

Manav Singhal, Nagarajan Natarajan, Dimitrios Dimitriadis, Divya Gupta, Nishanth Chandran

Pre-Print.

Explanations in Multi-Agent Search and Rescue Task

Manav Singhal, Vidhi Jain, Dana Hughes, and Katia Sycara

RISS Working Papers Journal 2021.

TECHNICAL SKILLS

Programming Languages: Python, C++, Java

Relevant Tools/Frameworks: HuggingFace, Pytorch, Pandas, Numpy, Keras, Tensorflow, OpenAI, Git

AWARDS AND HONORS

- Selected for the [Robotics Institute Summer Scholar \(RISS\) Program 2021](#) to pursue a summer research internship at the **Robotics Institute, Carnegie Mellon University**. Among 58 selected globally out of 700+ applicants.
- Selected for the [Reinforcement Learning Open Source Fest \(RLOSF\) 2021](#) to pursue a summer research project with **Microsoft Research, New York City**. Among 10 selected globally out of 200+ applicants.
- Awarded the [Summer Research Fellowship \(SRFP\) 2020](#) conducted by the **Indian Academy of Sciences (IAS)** to pursue a summer research internship at **IISc Bangalore**. Among top 5% selected out of 25,000+ applicants.
- Recipient of the [OP Jindal Engineering Scholarship \(OPJEMS\) 2019](#). Among 80 selected out of 1100+ applicants.
- Ranked **3rd** amongst 75+ participants in [Dishathon](#), a hackathon organized by **DishTV**.

RESEARCH EXPERIENCE

Explanations in Multi-Agent Search and Rescue Task

June 2021 - Dec 2021

CMU Robotic Institute Summer Scholar. Mentors: Prof. Katia Sycara and Dana Hughes

- Experimented with an approach using multiple-observer model, to interpret the decisions taken by agents through queries to a belief state, in a simulated multi-agent search and rescue task in Minecraft.

Train Scheduling using RL

May 2020 - July 2020

IAS Summer Research Fellow. Mentor: Prof. Shalabh Bhatnagar

- Worked on evaluating single-agent approaches, such as Dueling Deep Q Networks and Proximal Policy Optimization on the multi-agent Flatland environment for efficient train scheduling.

Using Class Activation Maps for Textual Entailment

May 2019 - June 2019

Research Intern. Mentor: Prof. Niloy Ganguly

- Studied Class Activation Maps in NLP to understand the words affecting the textual entailment prediction being made by the CNN model on the SNLI dataset.

MENTORSHIP, LEADERSHIP AND EXTRA-CURRICULAR

- Member of the [RISS 2021 Working Papers Journal](#) team curating the journal.
- **Secretary** of Web Club NITK: Coordinated 20+ computer science events organized for a group of 70+ students.
- **Executive Member** of IEEE NITK: Mentored 15+ students in CS summer program and recorded a [podcast](#) of my research journey to guide junior undergraduate students.
- **Finalist** at the [Speak For India 2019](#) edition.
- **Finalist** at the Team India selections for [World School Debating Championship 2017](#).