Manav Singhal

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Education

National Institute of Technology Karnataka — Surathkal, India
B.Tech in Electrical and Electronics (Minor in Computer Science). — *July 2018 – July 2022*

- GPA: **9.03/10.00**

Industry Experience

Maxim AI — August 2024 - Present

ML Engineer

- Benchmarking and improving LLM-based evaluators for evaluating customer's AI workflows (including agents).
- Building a synthetic data generation feature for the customers of the Maxim platform.

Microsoft Research India — July 2022 - July 2024

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]

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 Vrousgou*

- 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*

*Conference on Language Modeling, **COLM 2024**.*

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: LiteLLM, DSPy, HuggingFace, Pytorch, Pandas, Numpy, Tensorflow, OpenAI, vLLM, 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.