Manas Mhasakar

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EDUCATION

BITS Pilani, Goa Campus

Bachelors of Engineering, Computer Science   July 2019 - August 2023

Relevant Courses: *Operating Systems, Data Structures, Analysis Of Algorithms, Object Oriented Programming, Discrete Structures for Computer Science, Databases, Logic, Artificial Intelligence, Networking, Probability & Statistics*

PUBLICATIONS

[1] Manas Mhasakar, Shikhar Sharma, Apurv Mehra, Utkarsh Venaik, Ujjwal Singhal, Dhruv Kumar, Kashish Mittal. 'Comuniqa : Exploring Large Language Models for improving speaking skills'. Under review at ACM CHI'24 Late Breaking Work. arXiv:2401.15595   **arxiv**

RESEARCH EXPERIENCE

- **Research Fellow - Microsoft Research India**   July 2023 - Present
  Supervisor : Kashish Mittal

  ○ Developed an application leveraging **LLMs** with NLP and audio processing techniques for speech analysis.

  ○ Built **algorithms** for standardizing & enhancing **consistency** of LLM output using iterative few-shot learning.

  ○ Delivered feedback on **speech metrics** : pitch, pronunciation, vocabulary, grammar, sentiment, & fluency.

  ○ Investigated & conducted studies to understand **user preferences** on feedback from **AI** vs **human experts**.

- **Auto-Evaluation of Programs**   January 2022 - December 2022
  Advisor: Dr. Anup Basil Mathew, BITS Pilani, Goa & Dr. Mattias Ulbrich, KIT   ***Project Report***

  ○ Proposed employing **semantic equivalence** tools for swift, personalized evaluation of basic programming labs.

  ○ Integrated **KLEE** and **CBMC** in a clustering algorithm, segregating student solutions on semantic errors.

  ○ Added early **error detection** & **model checking** for correctness without a **predefined test suite**.

  ○ Implemented **automated program repair** using mutant generation, returning common errors to the instructor.

- **Sugamyata : Accessibility in Computing Education**   July 2022 - May 2023
  Advisor : Dr. Swaroop Joshi, BITS Pilani, Goa

  ○ Engaged in several projects researching lack of inclusion of **accessibility** in **CS curricula** in Indian colleges.

  ○ Developed course content that is **accessibility-aware** and evaluated its effects on student learning at BITS.

  ○ Conducted surveys to assess the impact & spread accessibility-aware development in **academia** and **industry**.

  ○ **Audited** accessibility features of **Indian govt. websites**, building custom tools for tracking on screen metrics.

- **Multilingual Code Snippets Training for Program Translation**   July 2022 - September 2022
  Advisor : Dr. Chandan K. Reddy, Dept of Computer Science, Virginia Tech

  ○ Contributed to data collection & pre-processing of CoST (**multilingual Code Snippet Translation**) dataset.

  ○ Curated data in 7 programming languages to support code translation, summarization and NL to code search.

  ○ Reviewed existing literature & worked on a new benchmark for our **multilingual program translation** model.

  ○ Worked on building **automated test case generation** tools for verification of generated code snippets.

- **Theorem Proving in Coq**   August 2021 - December 2021
  Dr. Abhishek Kr Singh and Dr. Pritam Bhattacharya, BITS Pilani, Goa

  ○ Researched application of formal proofs in **computational geometry** and **geometric modelling**.

  ○ Defined and constructed hypermaps in Coq using structural induction in a constructive point of view.

  ○ Designed & incrementally proved correct a functional **convex hull algorithm** using **hypermaps**.

Professional Experience

- **SuperPe — Backend Intern**   January 2023 - June 2023
  - Designed and implemented the backend for a scalable payments architecture handling **50k+** daily transactions.
  - Integrated **prefilling** of business docs, resulting in **70%** less onboarding time & **30%** boost in user growth.
  - Migrated vital **microservices** to **FastAPI** and introduced Amazon DynamoDB as a **cache** for faster lookup.
  - Refactored critical services like account verification, creation and transfers by identifying bottlenecks.
- **Dezerv. — Backend Intern**   September 2022 - January 2023
  - Developed **REST APIs** for interacting with **MongoDB** in **Go** for a digital wealth management platform.
  - Migrated core backend services to microservices, coded logic for **duplicate** and **fraudulent** transactions.
  - Deployed load balancers and horizontal scaling for handling **10k+** daily investments and concurrent transactions.
  - Worked on end-to-end pipeline for user registration, ascertaining credit score & identifying **high risk users**.
- **ServiceNow — Software Development Intern**   May 2022 - July 2022
  - Integrated **MS Teams** and **NetSuite OpenAir** with **ServiceNow portal**, enabling seamless communication and collaboration among project stakeholders by writing OpenAir plugins to fetch project tasks.
  - Developed and executed scripts and flows in **JavaScript** and **XML** to automate the creation, update, and deletion of project channels in MS Teams, reducing manual work and increasing developer productivity.
- **Coulomb.AI — Backend Intern**   November 2021 - April 2022
  - Implemented **backend APIs** and **automation scripts** in Python Flask for data storage, retrieval, and analysis, ensuring **high performance**, **scalability** and **reliability** of core services.
  - Optimized and deployed a SOTA Machine Learning model that increased battery lifespan by up to **40%** and reduced charging time by up to **25%** for various EV setups, using TensorFlow, PyTorch, and AWS.

Skills Summary

- **Languages**:   Golang, Python, Rust, Java, C, C++, Coq, JavaScript, SQL, Bash
- **Frameworks**:   PyTorch, Django, Flask, NodeJS, Bootstrap, ReactJS, FastAPI, React Native
- **Tools**:   MongoDB, Azure, Redis, Postman, Docker, GIT, PostgreSQL, MySQL, SQLite, AWS

Volunteer Experience

- **BITS Pilani Goa — Teaching Assistant**

  Teaching Assistant under the Computer Science Department of BITS Goa for the following courses :
  - Operating Systems   August 2022 - December 2022
  - Data Structures and Algorithms   January 2022 - May 2022
  - Introduction to Computer Programming   January 2022 - May 2022
  - Discrete Structures for Computer Science   August 2021 - December 2021
  - Object-Oriented Programming   January 2021 - May 2021

Extra-curricular Activities

- **Vice President - Center for Technical Education**   August 2021 - May 2022

  Managed a team of 30 motivated students to provide nonacademic skills through courses conducted by seniors based on practical learning usually in the after hours. Was involved in various mentoring activities, hackathons every semester and project fundings on campus.

- **Secretary - IEEE BITS Pilani Goa**   August 2020 - May 2021

  Led a team of 60 people to organize the annual tech symposium of IEEE BITS Goa, called Lumini, which was attended by over 400 delegates virtually. Responsible for creating and publishing the first technical magazine of our college to highlight the incredible projects and achievements of the various tech clubs.

- **Economic Times Campus Engineering Talent**   August'22

  Nominated as part of 91 students for India's best engineering talents in 2022. This edition of the ET Campus Stars had participation from 52,000+ engineering students from 2,000+ colleges across India.