Roy Akash | CS22M007

M.Tech CS | Indian Institute of technology, Madras

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Education

Program	Institution	%/CGPA	Year
M.Tech in CS	Indian Institute of Technology, Madras	8.58/10	2022-2024
B.Tech in CS	Government College of Engineering and Ceramic Technology	8.94/10	2018-2022
HS (Class 12)	Barasat Mahatma Gandhi Memorial High School	78.60%	2018
Class 10	Barasat Mahatma Gandhi Memorial High School	88.71%	2016

Work Experience

Software Engineer at Microsoft India   **June 2024 - Present**
India, Hyderabad Office, Joining June 2024

SDE intern at Amazon India   **May 2023 - July 2023**
India, Bangalore Office, Registration and Core Services Team

- Received an inclined offer based on the performance during the Internship.

- Internship with the Registration and Core Services Team at Amazon Bangalore. Implemented a **redirection feature** which is currently deployed to **production environment** on the **Amazon Worldwide Seller Central**, which automatically redirects seller from Add new bank account page to the account verification page. This implementation improves customer experience and reduces time and effort in verifying bank accounts. The framework did not inherently support redirection. Using **WebLabs (selective deployment)**, we **eventually deployed** redirection feature to sellers.

- In our implementation, we found one edge case for which our redirection feature was incomplete. To solve this problem, I designed and implemented **foundational API changes** along with suggestions from SDE-I and SDE-III. These code changes migrated logic from service orchestration package to service management package, which then calls service orchestration package based on certain parameters. This movement of orchestration logic into management service is a foundational code change that is a stepping stone toward team vision.

Teaching Assistant at CS Department, IIT Madras   **July 2022 - May 2024**
Introduction to programming, Object Oriented Programming, C++ Advanced Programming

- Was a lead teaching assistant in CS1100 managing 70+ teaching assistants and 350+ students who took the course. Was responsible for smooth operation of the course to the completion and was responsible for **question design**, conducting exams, doubt clearing and leading the exam evaluation done by the other TAs.

- Taught various computer science courses at IIT Madras, including a lead teaching assistantship and an instructor position in the **CS6150 Advanced Programming Lab in C++** course for incoming CS Masters students, **CS5410 Security in Cyber Physical System** for the under-graduate and graduate students, **CS2810 Object Oriented Design Lab** for second-year CS B.Tech students, and **CS1100 Introduction to Programming** for incoming B.Tech students of various departments at IITM coming through JEE Advanced. Responsibilities encompassed designing questions, **conducting classes**, **teaching**, **automated test-case generation**, and verifying student-submitted code.

Publications

Python basics to get started book   **Spring 2020**
Over 400+ five star ratings, Available on Google Play

- Python Basics to get started is an introductory Python book for first-year students to start with Python programming. With over 20,000 copies sold in the last three years, my Python introduction book is widely used by my juniors from B.Tech college and received over 480+ five-star ratings.

Technical Skills

- **Languages**: C, C++, Python, Java, GoLang
- **Web**: Python-Flask, Springboot
- **Database Systems**: MySQL PostgreSQL, NoSQL
- **Systems**: Docker, Redis, CI/CD

Key Research and Technical Projects

Master's Research Project in Theoretical Computer Science   **July 2023 - May 2024**
Theoretical Computer Science, Graph Theory, Graph Coloring   *Indian Institute of Technology, Madras*

- Researcher in the **Theoretical CS group, IIT-M**, collaborating with **Dr. B. V. Raghavendra Rao.**
- Broadly studying the complexity of graph packing coloring problems. Designing, architecting, and implementing several schemes for packing coloring in degree-bounded trees and other special graphs.

Large Scale Distributed Notification System   **June 2023 - August 2023**
GoLang, Python, Large Scale Distributed systems design, Database technology   *Indian Institute of Technology, Madras*

- This notification service implementation can scale up to millions of customers to reliably deliver notifications. The primary purpose of such a service is to provide central or local government or police the ability to deliver disaster notifications to millions of residents.
- Built on Golang and Python, the main notification service is divided into four services *RepositoryService*, *AuthorizationService*, *PersistentStoreService*, *Publisher* and *Subscriber*, each runs in their docker container, and are independently scalable. System Design, HLD, and other documentation can be found online.

AmbientBuddy   **June 2023 to July 2023**
Tailwind CSS, Vanilla JavaScript, ElectronJS   *Indian Institute of Technology, Madras*

- Beautifully designed AmbientBuddy is a macOS, Windows-based meditation app that has 30+ ambient sounds built into it. AmbientBuddy has the best design among all available ambient apps and works offline. AmbientBuddy is designed to work offline so that users don't require an active connection to listen to the audio.
- Audios are also customizable; users can mix multiple sounds and re-adjust volumes of multiple audio to listen to a calming experience. AmbientBuddy has a beautifully designed landing page, and the code is open-sourced.

algorithms.theroyakash.com   **Feb 2022 to Today**
Free interview preparation platform   *Indian Institute of Technology, Madras*

- Used by 650+ users from all over the world, these are materials for coding interviews, has over 150+ interview questions with detailed explanations on several data structures and algorithm concepts. It is a starting point for many bachelor and master in computer science students to start their interview preparations.

AKDSFramework   **Nov 2020 - Sep 2021**
Python Package with PIP   *Government College of Engineering and Ceramic Technology*

- Pure pythonic, efficient implementations for all popular data structures and algorithms. AKDSFramework provides one-line benchmarking tools, an easy-to-use one-of-a-kind Big O analyzer, and a caching decorator.
- AKDSFramework has API to draw graphs from an AKDSFramework graph object (using mermaid-js API in Python, which I contributed to the mermaid project). All run-able functions and modules are tested with Python unit tests using GitHub actions. Framework documentation and open source code are available online.

Other Projects

AKHCRNet   **April 2020 - October 2020**
Independent Research   *Government College of Engineering and Ceramic technology*

- `AKHCRNet` is a state-of-the-art deep neural architectural solution for handwritten character recognition for Bengali alphabets. Gained eight citations, including researchers from IITs.

@sosleafy News Bot   **Jun 2021**
Python, GitHub Actions Cron Jobs, RestAPI   *Government College of Engineering and Ceramic Technology*

- @sosleafy is a Twitter account and a telegram group where every 3 hours, a bot posts fresh news content run via GitHub actions. Using **Github actions** and **Cron jobs**, the script takes new news content from the web and puts it in a GitHub repository. Then once every three hours, another **cron job** is scheduled to post new news content on Twitter and Telegram, setting the GitHub repository as the news source. In it's operation **@sosleafy** posted over **11K** tweets on twitter and currently shut down.

placeholderfile in `pip` package manager   **October 2020**
Python installable package with Pip   *Government College of Engineering and Ceramic Technology*

- `placeholderfile` is a random filename and UUID generator installable via pip.

Course Work

Key Courses in M.Tech   **July 2022-May 2024**
(Core and electives)   *Indian Institute of Technology Madras*

- *Courses*: Advanced data structures and algorithms, Randomized Algorithms, Computability, and Complexity theory, Advanced Programming Lab, Probabilistic and Smoothed Analysis of Algorithms, Security in Cyber Physical Systems, Digital System testing and testable design, Theory and application of Ontologies.

Key Courses in B.Tech   **August 2018-April 2022**
(Core and electives)   *Government College of Engineering and Ceramic technology*

- *Courses*: Theory of computation, Discrete Maths, Computer Networks, Compiler Design, Design and analysis of Algorithms, Data Structures, Object Oriented design, Digital Logic, Computer Organizations, Operating Systems, Database management systems, Machine learning, Deep learning.

Achievements

- Successfully qualified *GATE CS (2022) with over 98.5* percentile,
- Became Course topper and Elite + Silver Medal in NPTEL Cloud computing course conducted by IIT Kharagpur,
- Got 70% in Theory of computation NPTEL Course conducted by IIT Kanpur.