Abhishek Shree

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Education

Year	Degree	Institution	Score
2020 - Present	B.S., Economic Sciences	Indian Institute of Technology Kanpur	8.8/10.0
2020	CBSE – XII	Loyola High School	95.2%
2018	CBSE – X	Loyola High School	98.0%

Work Experience

Quantitative Technologist Intern

Qube Research & Technologies   *May 2023 - July 2023*

- Built a solution to manage datasource permissions to individuals to tackle problems of correlated alpha generation, etc.
- Developed the application, keeping security and usability as priorities, with integrations to existing auth solutions like Okta
- Enabled auditing and reversion of changes made by administator before finally applying to production databases
- Explored algorithms to enumerate differences in the states of large documents efficiently
- Built a library, enhancing existing diffing speed (by DeepDiff library) from 12s to 100ms, optimizing overall performance
- Received a Pre Placement Offer from the company based on the work done during the internship

Product Engineer Intern, Infrastructure

Paradime.io   *August 2022 - March 2023*

- Built Kubernetes Vulnerability Scanner for automated vulnerability assessments deployed via Airflow
- Developed a way to connect to the production clusters securely inside Airflow for the assessment scripts to execute
- Implemented a web-based Kubernetes UI with multi-level role access, attached a sidecar for it to be accessible via internal VPN
- Implemented alarms for failed Kubernetes nodes (failing status check) in ASG(auto-scaling groups) and per node
- Installed cluster-level Prometheus instances, AWS-managed Grafana, and Prometheus (AMP) for monitoring
- Built a pipeline to transfer metrics from cluster-level Prometheus instances to the central AWS-managed Prometheus instances
- Built custom Grafana dashboards to generate meaningful insights from the collected metrics
- Also worked on adding Hightouch (a reverse ETL solution) as an integration in the existing Paradime lineage

Product Engineer

Students' Placement Office, IIT Kanpur   *March 2022 - June 2022*

- Created the Recruitment Automation System for use in IIT Kanpur by **over 500 companies** and **2500 students** in the upcoming placement and internship phases **each year** [available here for use]
- Delivered enhanced security, scalability and achieved an improvement in response time by approximately **60%**
- Designed and built a microservices based backend in Go with context models, an async mail & a Content Delivery System
- Built a responsive frontend in Next.js, with strictly-typed API calls, notifications, Lazy Loading, page-level auth and RTE
- Ideated and wrote CI/CD pipeline for smooth deployment, orchestrated using Nginx and Docker

Cybersecurity Engage Program Mentee

Microsoft   *May 2022 - June 2022*

- Explored various aspects of cybersecurity, including Cyber Forensics, Network Security, and Malware Analysis
- Wrote a paper on *Safeguarding Indian Telecommunication Services* from a zero-day attack [`Also accepted at IJISRT`]

Skills

Programming	Go, Python, C++, JavaScript, Rust, Scala, Haskell
Web	Gin, Flask, Fiber, React, Redux
Database Tools	PostgreSQL, MongoDB, Redis, MySQL
DevOps	Docker, Kubernetes, AWS, Prometheus, Grafana, Nginx, Terraform, Helm
Miscellaneous	Git, Bash, ROS, LaTeX

ACHIEVEMENTS

- Received the **Academic Excellence Award** for exceptional performance in Academics at IIT Kanpur
- Among the **top 25** teams(among more than 500 teams) in MIT's BattleCode 2021 Scrimmaging Rounds
- Among the **top 2.4%** of students, JEE Advanced 2020
- Among the **top 0.2%** of students, JEE Main 2020
- Among the **top 10%** programmers on Hackerearth in 2017
- Participated and completed the Google FooBar challenge, 2021

KEY PROJECTS

Undergraduate Project: Essays on Dynamic Programming
UNDER PROF. JOYDEEP DUTTA
⚲ Report
January 2023 - Present

- Aim to understand the texts of Richard E. Bellman, the original creator of the concept of dynamic programming
- Solved some of the problems proposed by the author in his book, Dynamic Programming, in generalized metric spaces
- Working on introducing and tackling problems in Optimization in Economics and Finance using the same idea

Route Planning for Optimized Delivery
INTER IIT TECH MEET 11.0
⚲ GrowSimplee
January 2023

- Created an end-to-end application for optimal route planning, minimizing total time taken and distance traveled for n drivers and k delivery points. Was also constrained by drivers' bag sizes and working hours, and product delivery deadlines
- Solved the problem by reducing it into a logic expression including soft (penalty-based) constraints, using Google OR Tools
- Used Local Guided Search to navigate the huge search space efficiently to find a valid solution with the least penalty
- Designed a system to include real-time distance and time matrix of the delivery locations using OSRM and Bing Maps API
- Added functionality for rerouting the driver's path on dynamic addition and removal of delivery points by the admin
- Won the **Bronze Medal** contributing to the overall 3rd position of IIT Kanpur among the 21 participating IITs

Digital Alpha SaaS Analyser
INTER IIT TECH MEET 10.0
⚲ SaaS-Analyzer
March 2022

- Developed a scalable web app and an ML pipeline to analyze SEC filings and obtain SaaS metrics for companies
- Parsed relevant sections (10K, 10Q and 8K) of the SEC Filings using BeautifulSoup and some external APIs
- Extracted SaaS metrics using NER, window search algorithm, used FinBERT (SOTA) to analyze sentiments along with section summarization using legal-pegasus
- Developed Frontend in React. Gave a modern look to UI using plugins like Chart.js to meet the problem statement
- Won the **Silver Medal** contributing to the overall 2nd position of IIT Kanpur among the 22 participating IITs

Breaking Cryptosystems
PROF. MANINDRA AGRAWAL, CSE DEPT., IIT KANPUR
Course Project
January 2023 - May 2023

- Performed cryptanalysis of Substitution cipher, Vigenere cipher, Substitution Permutation Network
- Also broke 6-round DES, an AES variant, and RSA (for small e) using Coppersmith's algorithm, clearing the game

IITK Coin
SUMMER PROJECT, PROGRAMMING CLUB
⌗ IITK-Coin
May 2021 - December 2021

- Developed a Go and React-Native application for a centralised pseudo-currency system for use in IITK
- Built the UI using custom components, axios, secure-store and redux, allowing multiple states and app navigation
- Involved Database Management, User Authentication, Hashing & Salting and User Session Validation with JWT
- Built robust REST APIs to handle concurrent transactions and multi-level user permissions

Autonomous Underwater Vehicle
TEAM AUV-IITK
Faculty Advisor: Prof. Indranil Saha
April 2021 - Present

- Improved the team website ⬈, which ranked **3rd** amongst **52** participating teams in **Robosub, 2021**, the largest competition for student-built AUVs in the world
- Utilized Extended Kalman Filters based SLAM algorithm to enhance pose estimation and navigation
- Implemented and researched the efficiency of graph-based, probabilistic, and deep learning-based SLAM algorithms like Fast-SLAM and RatSLAM in underwater conditions
- Worked on writing driver, denoising, & integration of the newly acquired Waterlinked DVL based on serial communication

MCMC Methods in Julia
SUMMER PROJECT, STAMATICS
⌗ MCMC-Methods-in-Julia
April 2022 - June 2022

- Implemented sampling methods including Accept-Reject, Inverse Transform and Importance Sampling techniques
- Learned the mathematics behind Bernoulli Factories, Bayesian Models, MLE, Regression, and Markov Chains
- Implemented MCMC algorithms like Metropolis-Hastings, Gibbs Sampler, Barker's and portkey Barker's algorithm

Positions of Responsibility

Web Head   Students' Placement Office (SPO)
IIT KANPUR   *March 2022 - April 2023*

- Lead a team of **5** Executives and **3** senior developers
- Developed monitoring and automation solutions for developing infrastructure pertaining to SPO
- Maintained the organization's servers and VM, designed new infrastructure, including the website, CDN, and portals
- Solved critical networking challenges while various deployments within IITK and SPO internal networks

Team Head | Software Subsystem   Team AUV-IITK
IIT KANPUR   *May 2022 - April 2023*

- Lead a team of 50+ undergraduates to participate in international marine robotics competitions, including RoboSub 2023
- Engaged in discussions with companies for sponsorship, securing acquisition of state of the art DVL (DVL-A50) sensor
- Responsible for improving the software stack and design of our third generation **AUV-Tarang**

Relevant Courses

Data Structures & Algorithms	Software Engineering[i]	Machine Learning[i]	Modern Cryptology
Game Theory & Mechanism Design	Econometrics	Probability & Statistics	Real Analysis
Economics of Uncertainity & Information	Linear Algebra & ODEs	Industrial Economics[i]	Introduction to Electronics

i: In progress

Extra Curricular

- Mentored **30 students** in a project under Stamatics, covering Number theoretic theorems and their applications
- Helped **6 freshers** assimilate to IITK norms and **assisted** Counselling Service conducting Freshers' Orientation
- Maintain a personal webpage and blog at abhishekshree.github.io