Aman Pushkar

Roll No.: MC22BT004
B.Tech in Maths and Computing
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Education

- **Indian Institute of Technology, Dharwad** *2022-2026*
  B.Tech in Mathematics and Computing CPI: 8.79
- **Delhi Public School Eldeco, Lucknow** *2021*
  CBSE (Class - 12) Percentage: 96.2
- **St. Peter's School Ambedkarnagar** *2019*
  ICSE (Class - 10) Percentage: 92.8

Projects

- **Peer-to-Peer VoIP Platform** [Link]
  – Designed a peer-to-peer Voice over IP (VoIP) application using Python sockets and UDP for low-latency, real-time audio communication.
  – Implemented peer discovery and dynamic registration to enable seamless connectivity in a decentralized network.
  – Gained hands-on experience in socket programming, real-time communication, and peer-to-peer networking protocols, improving scalability and fault tolerance.
- **Investment Management Website** [Link]
  – Created a full-stack MERN application for financial advisors to create investor relations.
  – Built using MERN stack (MongoDB, Express.js, React.js, Node.js) with responsive UI, API integrations, and secure architecture.
  – Built RESTful APIs for investor Information Management (CRUD operations).
  – Implemented centralized error handling for both APIs and UI, improving reliability and debugging efficiency.
- **A Linux Text Editor with File Encryption** [Link]
  – Designed and executed a secure Linux-based text editor with built-in file encryption to ensure data confidentiality.
  – Refactored and modularized codebase to improve maintainability, scalability, and readability.
  – Optimized low-level I/O operations and integrated encryption routines at the system-call level, enhancing performance, reliability, and system-level efficiency.
- **Fast Fourier Transform and Its Applications** [Link]
  – Applied Discrete Fourier Transform(DFT) and Fast Fourier Transform (FFT) algorithms from scratch using Python.
  – Applied Fourier analysis techniques for signal processing, enabling efficient analysis and transformation of time-domain signals into frequency-domain representations.
  – Employed FFT-based compression to achieve 96.05% image size reduction while retaining visual quality and FFT-based filtering to remove 85–90% of high-frequency noise
- **Strategic Five** [Link]
  – Enhanced a two-player strategy game with Monte Carlo Tree Search (MCTS) and Minimax with alpha-beta pruning.
  – Applied MCTS to handle decision-making in complex and uncertain environments, demonstrating applicability of reinforcement learning and game theory concepts beyond gaming.
  – Improved game AI performance using self-developed heuristics, enhancing decision quality and reducing computation overhead.
- **Implementation of Text-to-Image Model RPG** [Link]
  – Built RPG (Recaptioning, Planning, Generation) framework using LLMs and Diffusion Models for multimodal tasks.
  – Integrated DeepSeekR1 API with diffusion pipelines for real-world use cases.
  – Applied to medical imaging, showcasing potential for diagnostic assistance and healthcare use.

Skills

Technical Skills in: C/C++ | Java | Python | Git | JavaScript | React.js | Bash | Scripting | Linux | NS3
Soft Skills: Communication | Time Management | Teamwork | Creativity | Problem-Solving | Critical Thinking
Relevant Coursework: Mathematical Finance | Statistics | Data Structures and Algorithms | Computer Architecture | Operating Systems | Computer Networks | Data Analysis | Mathematics for Data Science | Database and Information Systems