Karan Rajendra

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Education

Stony Brook University **Aug 2023 – May 2025***

Master of Science in Computer Engineering *Stony Brook, New York*

- **GPA: 3.91/4.0**; Relevant Coursework: **Advanced Algorithms**, **Distributed Systems**, **Operating Systems**, **Computer Networks**, **Robotics & Computer Vision**, **Digital Image Processing**, **Quantum Systems**

Visvesvaraya Technological University **Aug 2017 – Aug 2022**

Bachelor of Engineering in Computer Science *Bangalore, India*

- Relevant Coursework: **Artificial Intelligence & Machine Learning**, **Database Systems**, **Data Mining & Analysis**, **Product Design & Strategy**

Skills

- **Programming Languages:** C++, Python, Java, JavaScript (ES6+), TypeScript, SQL, PHP, Go
- **Frontend Technologies:** React.js, Next.js, Redux, HTML5, CSS3, Tailwind, Material-UI
- **Backend Technologies:** Node.js, Express.js, Django, Flask, FastAPI, GraphQL, RESTful APIs
- **Cloud & DevOps:** AWS (S3, Lambda, EC2, API Gateway, DynamoDB), Docker, Kubernetes, Terraform, Microservices
- **Database Management:** MySQL, PostgreSQL, MongoDB, Redis, Firebase, Query Optimization
- **Testing Security:** Jest, Mocha, Unit Testing, CI/CD (Jenkins, GitHub Actions), OAuth, JWT, API Security
- **Tools & Platforms:** Git, Kafka, Webpack, Vite, Nginx, Linux, Memory Management, Job Scheduling
- **Software Development Methodologies:** Agile (Scrum, Kanban), TDD, SDLC, Performance Optimization

Experience

Stony Brook University **Aug 2024 – Dec 2024**

Graduate Teaching Assistant - Computer Vision *Stony Brook, New York*

- Mentored 40+ graduate students in **Computer Vision, Deep Learning**, and **Image Processing** using **Python and OpenCV**.
- Designed **object detection, feature extraction, and CNN assignments**, improving student comprehension by **25%**.
- Reviewed and optimized **student code**, reinforcing **clean coding practices, algorithm efficiency, and debugging techniques**.

Impavid Technologies **Sep 2022 – Feb 2023**

Full Stack Software Developer *Bangalore, India*

- Developed and deployed a **full-stack web application** using **React.js, Node.js, Express.js, and MongoDB**, reducing **page load time by 30%**.
- Designed **RESTful APIs** with **query optimization and indexing**, improving **data retrieval by 25%** and reducing server response time.
- Refactored the **frontend architecture** using **modular React components and Redux**, accelerating **development cycles by 40%**.
- Implemented **JWT & OAuth authentication**, strengthening API security and reducing unauthorized access risks.

Projects

Graph Partitioning with Fiduccia-Mattheyses Algorithm | *C++, Algorithms, Data Structures* **Dec 2023**

- Implemented the **Fiduccia-Mattheyses (FM) algorithm** in C++ for **graph partitioning**, reducing **edge cut size by 62.7%** on large-scale datasets.
- Developed an optimized **bucket-based gain update system**, achieving **O(n) time complexity** and improving **partitioning efficiency**.
- Validated results using **IBM benchmark circuits**, demonstrating **significant performance gains** in partition quality and runtime.

Infectious Disease Simulation Model | *C++, Multi-threading, Distributed Computing, OOP* **Dec 2023**

- Developed a **multi-threaded epidemiological simulator** in C++ to model **disease spread for 300K+ agents**, leveraging **parallel processing**.
- Optimized **simulation complexity to O(n log n)**, reducing **computation time by 40%** and enhancing scalability.
- Integrated **real-time data visualization** using Python (**Matplotlib, Seaborn**) for outbreak trend analysis.

COVID-19 Detection from X-Rays | *Python, CNN, OpenCV, TensorFlow, Keras* **May 2022**

- Built a **deep learning CNN model (TensorFlow)** to classify COVID-19 from X-rays, achieving **98.7% accuracy**.
- Optimized **Inception V3, DenseNet121, and ResNet50** for enhanced **classification performance**.
- Deployed the model with a **Flask API**, enabling **real-time X-ray analysis** with sub-second inference time.