

# Varun C

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## Education

- PES University** | *Computer Science and Engineering* 2021 - 2025
- **Cumulative GPA: 9.36/10.00** (As of June 2024)
  - **MRD Scholarship** (Top 5% Ranking in 3rd,4th,5th,6th semester)
  - **KCET Rank: 1733**

## Experience

- Teaching Assistant – Big Data** | *Kafka, Spark, Hadoop* July 2024 – Present
- Designed and graded a Spark assignment for over 200 students, ensuring comprehensive coverage of the syllabus and covering a variety of distributed data processing concepts.
  - Reviewed and provided feedback on distributed systems projects, including task queues using Kafka, multi-client file transfer systems, and real-time log management frameworks.
- AVEVA** | *.NET Core, Entity Framework, SQL, RxJS, Angular* June 2024 – July 2024
- Created interactive data visualization charts, implementing real-time data streams and added drill-down functionality, enhancing user analysis capabilities.
  - Engineered a high-performance API, implementing asynchronous request handling that increased concurrent user capacity and optimized SQL Server procedures, reducing data retrieval times from 40 seconds to 2 seconds—a 95% improvement—significantly enhancing application responsiveness and user experience.
- Snow Mountain AI** | *Supabase, PostgreSQL, NextJS, ExpressJS* June 2023 – Aug 2023
- Led the migration of database structure from team-based to organization and project-based schema, improving data organization for the company website.
  - Revamped the frontend of the company website, enhancing user experience and modernizing the interface while maintaining compatibility with the new database structure.
- STARC-PESU** | *OpenCV, TensorFlow, MediaPipe* June 2023 – July 2023
- Designed a computer vision system for ball tracking and wide ball detection in cricket matches, achieving 90% accuracy and incorporated pose estimation to dynamically adjust wide lines based on batsman's stance.
  - Integrated ball trajectory and pose data into a Unity3D visualization, processing real-time data at 60 fps and reducing false wide ball calls considerably compared to traditional systems.

## Projects

- Capstone Project: Diagrams To Code** | *AWS, Yolo, FastAPI, MongoDB*
- Developed a system to generate AWS CloudFormation templates from architecture diagrams using YOLOv8 (98% accuracy) for image recognition and dependency graph resolution based on ground rules stored in MongoDB, ensuring precise resource relationships. The model is trained on close to 300 AWS services.
  - Leveraged a microservices application structure to achieve template generation latency of under 3 seconds, regardless of image count, with parallel processing for scalability.
- NEAT Cars** | *NEAT Algorithm, AI Optimization, Python*
- Implemented the NEAT (NeuroEvolution of Augmenting Topologies) algorithm from scratch, developing a custom neural network model that evolved to successfully navigate user-generated tracks after 500 generations on average.
  - Engineered physics-based car movement and collision detection and further optimized the evolutionary process, achieving a significant reduction in training time by implementing parallel processing, allowing the system to evaluate 100 car agents simultaneously.
- Distributed Load Testing Framework** | *Kafka, NodeJS*
- Designed a distributed load-testing framework using Kafka, enabling dynamic scaling with an arbitrary number of driver nodes to simulate real-world conditions and handle 500+ concurrent requests in real-time. Supported two test modes: Avalanche for high-frequency bursts and Tsunami for sustained load with configurable delays.
  - Developed a heartbeat protocol to monitor and ensure the availability of driver nodes, with a detection time of less than 2 seconds, enhancing reliability and fault tolerance in dynamically changing environments.

## Skills

**Programming Languages:** C/C++, Python, Javascript, Typescript, SQL, Java, C#  
**Machine Learning:** PyTorch, Pandas, NumPy  
**Big data and Cloud:** Hadoop, Kafka, Spark, Docker, Kubernetes

## Achievements

- Placed first in Hacknight, an open source contribution code competition conducted at college.
- Placed first in Override, a hackathon held by Google Developers Student Clubs.