NIKHIL NAIR

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Education

Vellore Institute of Technology   **Aug 2021 - Jun 2025**
Bachelor of Technology in Computer Science and Engineering with spec. in Cyber Physical System   *Chennai, India*

- **Relevant Coursework:** Data Structures and Algorithms, Operating Systems, Computer Networks, Embedded Systems, Network Security, Artificial Intelligence, Microprocessor, Cryptography, Control Systems, IoT Systems Design

Experience

TATA Elxsi   **Oct 2023 – Dec 2023**
AI and Robotics Intern in Transport Business Unit   *Chennai, India*

- Contributed to the implementation of perception algorithms, achieving an improvement in 3D object detection accuracy through Lidar-Camera fusion.
- Leveraged ROS2 and OpenCV to efficiently process the KITTI dataset, achieving reduction in data preprocessing time, accelerating the development of the perception system.
- Developed 3D point cloud projection onto 2D images, improving LiDAR-Camera fusion accuracy.

Patent & Publication

A System to Recognize Number Plate and Allow Entry of a Vehicle   **2024**
Patent Number: 202441051527   *Published*

- Developed a system leveraging computer vision to automatically recognize vehicle number plates and control access based on recognition results, enhancing security and efficiency in restricted areas.

Isogeny-Based Security for Marine Genomic Insights   **2024**
INTERNATIONAL CONFERENCE ON ICT DIGITAL, AND SUSTAINABLE DEVELOPMENT   *Accepted*

- Contributed to the field of marine genomic insights through Isogeny-based security research.

Projects

TTGO InfoDash: Real-Time ESP32 Smart Dashboard | *C++, Arduino, REST APIs, OAuth2*   **2025**

- Designed and implemented a real-time dashboard on the TTGO T-Display ESP32 to display live weather updates (OpenWeatherMap), a network-synced clock, Spotify Now Playing or Last Played tracks (via Spotify Web API and OAuth2 token refresh), and F1 driver standings (via F1 API), using TFT graphics, JSON parsing, and button-based screen switching for an interactive embedded UI experience.

NAS-Optimized Deep Learning Model for Concrete Strength Prediction | *Python, Keras*   **2025 (Capstone)**

- Developing a Neural Architecture Search-optimized deep learning model for predicting the compressive strength of various concrete mixtures, integrating automated hyperparameter tuning to enhance accuracy and generalization, aiming to help civil engineers optimize material composition for stronger, cost-effective, time-saving, and sustainable concrete formulations with minimal material waste.

Sentinel : Smart ADAS-Integrated Fleet Monitoring System | *Python, Open CV, Flask, JS*   **2024**

- Developed a fleet management solution for buses and trucks with ADAS features, including collision detection, driver monitoring using dlib and OpenCV, and real-time overcrowding detection with YOLO, integrated with GPS-based vehicle tracking via a Flask backend and a web dashboard for fleet managers to access critical insights on vehicle location and driver behavior.

Eureka : Research Access Chrome Extension | *JavaScript, Chrome APIs*   **2024**

- Developed a Chrome extension that streamlines access to open-access versions of scientific articles by checking alternate repositories. Aimed at academic efficiency.

AI Gym Trainer/Assistant | *Python, Open CV, Mediapipe*   **2023**

- Developed a real-time fitness tracking system using Python, OpenCV, and Mediapipe, integrating pose detection and angle calculations to count exercise repetitions for a personal project, solving a real-life problem.

Technical Skills

Languages: Python, Java, HTML/CSS/JS, SQL, ROS, C++
Developer Tools: Arduino, Overleaf, Google Cloud Platform, Figma
Technologies/Frameworks: Linux, OpenCV, Numpy, Qiskit, Pandas, Matplotlib, Git, DSA
Soft Skills: Creativity, Communicative, Adaptability, Attention to Detail, Data Driven
Interests: Language Learning, Weight Training, Sketching, Reading, Formula-1

Certifications & Achievements

Math-Based Introduction to Quantum Computing, Cryptography & Quantum Machine Learning: Completed via Udemy in 2025. Covered topics like Python, Q#, and Qiskit.
VITISH Hackathon 2024: Top 45 spot out of 548 for Smart India Hackathon 2024 and invited to pitch by the incubator.
PMSS Scholarship: Awarded for academic excellence and leadership potential.
Machine Learning Specialization: Completed via Coursera in 2023.
Google Cloud Career Practitioner Campaign: Completed in 2023.
Google Cloud Foundation Program: Completed in 2024.

Leadership / Extracurricular

U&I Trust   **July 2024 – Present**
Teaching Volunteer   *Online*

- Facilitated educational sessions for underprivileged students, fostering academic growth and personal development.

Business Innovation Community   **Sept 2022 – April 2024**
Head of Design Team   *VIT Chennai*

- Led and managed a team of 17 members and Initiated, supervised and worked on multiple design projects, including promotional materials, event posters, resulting in increased club visibility, the most successful sponsorship record to date.