# Nishant Kumar Bharali

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GitHub | Portfolio

## EDUCATION

**Virginia Polytechnic Institute and State University**, Blacksburg, VA — Anticipated Graduation (05/25)
*Master of Science in Computer Engineering*
***Relevant Courses:*** *Machine Learning(CS5805), Computer Vision(ECE5554), Robotics and Automation(ECE5704)*

**Vellore Institute of Technology**, Vellore, TN, India — 2018 – 2022
*Bachelor of Technology in Electronics and Communication Engineering,*
**Relevant Courses:** Object-Oriented Programming; Robotics and Automation; Image Processing; Signals and Systems; Controls System; Digital Logic Design; Digital and Analog Electronic Circuits; Applied Linear Algebra; Applied Calculus

## WORK EXPERIENCE

**Product Development Engineer** | **Mahindra & Mahindra Limited** | Chennai, TN, India — August 2022 – July 2023
*R&D Electrical & Electronics Department [Automotive Product Development]*

- Managed cockpit software architecture for ICE & BEV Vehicles: Mahindra Scorpio N, XUV700, XUV400 EV. Conducted bench-level and vehicle-level testing.
- Partnered with Tier 1 suppliers for software validation, securing Google green light approval leading to **USD $100K p.a. in CAPEX approvals** - $10K more than the ask.
- Achieved **2 Android Auto certifications** post software testing processes - PCTS Verifier, QSuite, UX, GPS/Navigation, sensor logging leading to a **15%** revenue growth in sales.
- Tailored SRDs and SOPs with vendors for product manufacturing optimizing project timelines by 10%.
- Integrated OTA updates, GPS benchmarking and connectivity features with cross-functional teams like ADAS, HMI and wiring harness for client satisfaction.
- Demonstrated expertise in Android and QNX OS, achieving **93%** bug fixes in Android Auto's initial release; Diagnostics tools like CANalyzer, CANoe, Garuda 2.0 for CAN BUS analysis of Electronic Control Units (ECU)..
- Experienced in writing test cases from system requirements and applying **machine learning** supervised learning algorithms in customer use cases and data. (Datasets of different types of customers with their information to keep sales intact)

**Software Engineer Intern** | **Oracle Cerner** | Bangalore, Karnataka, India — Jan 2022 – July 2022

- Worked on a scalable healthcare IT web application using **Java, Spring Boot, Python, React,** and **JavaScript**, focusing on patient-bed-nurse allocation enforcing **Spring Security** and **React-Redux** for faster web-page preprocessing.
- Created REST API controllers tested with POSTMAN, achieving 95% unit test coverage with **JUNIT**, **Mockito**, and **Jest/enzyme**.
- Conducted code reviews and merged around 20 commits/week reducing software defects by **20%** alongside optimizing RDBMS MySQL database size by 7% using scripts.
- Employed Agile scrums and machine learning to cluster suppliers using medical device data, saving the team 10 hours/week.
- **DevOps:** Utilized Jenkins for CI/CD and pipeline staging script-based automation, integration and deployment processes.
- Collaborated with cross-functional teams **improving** the product function by ~ **3%.**

**VLSI Design Trainee (Internship)** | **Maven Silicon** | Bangalore, Karnataka, India — May 2021 - July 2021

- Hybrid training upon the VLSI methodologies and understanding the functionality of system Verilog.
- Hands-on training upon basic Verilog concepts to model electronic systems in HDL and hierarchical design.
- Design and verification of digital circuits at the register-transfer level of abstraction.

**Undergraduate Teaching Assistant (ECE2003)** | Digital Logic Design | VIT Vellore, India — 2019-2021

- Worked as an undergraduate teaching assistant under Dr. Balakumar for the undergraduate course ECE2003 - Digital Logic Design.
- Carried out certain tasks of assisting sophomore-level students with laboratory sessions, grading assignments, examinations and laboratory results, maintaining and analyzing lab equipment, holding office-hours for freshers, and report to the faculty with logs of all the required information.

## PROJECTS

**Idea Repository API** | Spring boot, Redux Saga, Postman API, JSON, Git, Jenkins, MySQL, Oracle Database, Reactjs

- An API for a full-stack web application to establish user security - authorization and authentication at the backend with Redux-based UI focus on frontend. Published as a technical paper - web application improved test user satisfaction ratings by 15%
- Emphasis on using redux-saga middleware instead of Thunk - faster web page response; improved scrolling efficiency by 10%
- GitHub: https://github.com/NishantBharali/projects

**Advanced applications of Machine Learning** |Pandas, Keras, SciPy, Matplotlib, Numpy, Tensorflow, Pillow, OpenCV

- Designed machine learning algorithms on varied complex datasets, simulated and established in real-world scenarios with 1000+ entries.
- Implemented and hosted on my blog posts. Check them out through the link: https://www.nishantkb.info/blog.html.
- Employed algorithms like Probability theory and random processes, Clustering methods, Classification models, Linear and non-linear regression techniques, predictive analysis, and finally anomaly/outlier detection on a practical data-set.

**Autonomous Navigation with Collision Avoidance using ROS** | ROS - SLAM, GMapping, Odometry, Laser Scan, GazeboSim

- Designed an obstacle avoidance algorithm for which we used ROS GMapping in our 2 wheeled robot to generate a map using SLAM technique; Used the robot Laser Scan and Odometry data to generate this map.
- Performed high fidelity simulation on Gazebo to develop test algorithms and design; path planning was incorporated.

**Information Data Hiding using Steganography Techniques** | OpenCV, Pillow, SciKit-Image, NumPy, Matplotlib

- Presented Comparative Image analysis between the two data hiding techniques are made on the reconstructed image to conclude which Steganography method achieves better results, Least Significant Bit (LSB) or Discrete Cosine Transform (DST)
- Automated the generation and evaluation of 35,000 images, achieving an 87% pose detection accuracy from the model

## SKILLS

**Technical:** Python, Java, MATLAB, SQL, HTML, CSS, React, Javascript, Linux, Git, CAN, LIN

**Frameworks and Tools:** RESTful API, GitHub, Jenkins, Microservices, Vector CANalyzer, CANoe, Wireshark, Android, OpenCV, POSTMAN, Android Auto PCTS Verifier, ROS, Gazebo, MySQL, Scikit-learn, Tableau, Power BI, Spring, JUNIT5, Jupyter

**Other:** Agile, JIRA, Product & Project Management, eLMS (Electronic Life Management System), Microsoft Office Suite

## ACHIEVEMENTS AND ORGANIZATIONS

- **SAE Autodrive Challenge** (Fall '23) : Participating in the Vehicle Control and testing sub-team under working on Q23-24 cycle learning through training and workshops on topics like Machine Vision, ROS2 and MATLAB GUI's
- **Undergraduate Teaching Assistant** for the course Digital Logic Design (ECE2003), VIT Vellore (2019-2021)
- Secured Silver Rank in **IoT - Domain Specialist** conforming to National Skills Qualifications Framework Level 8, 2021
- Assistant Web Developer at **IEEE IAS**, VIT Vellore, 2020
- Core Committee Member, **IEEE - Circuits and Systems Society**, 2019-2020
- Core Committee Member, **IEEE Computer Society**, 2019-2022

## PUBLICATION(S)

**Full Stack Web Development of Redux-based Applications with Dynamic Microservices (Case Study - IDEA REPOSITORY), 2022-2023**

- Successfully certified and published the technical research paper in a peer-reviewed journal with an acceptable impact factor where the synopsis of the paper was web development strategy to develop applications based on redux using redux-saga middleware instead of its native Thunk middleware for faster web page response and to improve scrolling efficiency by 10%.
- Use of the MySQL server and spring framework was incorporated for dynamic usage of the backend while the saga middleware at the frontend uses the data stored in redux store dynamically and asynchronously to facilitate faster and responsive web page.