Nidhi Shekhar

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◇ Gmail ◇ LinkedIn ◇ GitHub ◇ Portfolio

Education

PES University — **Bengaluru, KA**

Bachelor of Technology in Computer Science and Engineering — **Sep. 2022 – June 2026**

Work Experience 1 | Full-Stack Intern at TwoSpoon.ai — Oct 2025 - Present

End-to-End Jira like Service Management System

- Engineered a multi-tenant Jira Cloud Integration platform with OAuth2.0, using Atlassian REST APIs for dynamic service desk, issue and user management.
- Designed and implemented microservices using TypeScript, Node.js, Express.js, PostgreSQL, with Redis backed caching and JWT-secured endpoints
- Automated project, ticket and workflow synchronization via advanced JQL, webhooks and custom field mappings, supporting real time updates and audit trails.
- Containerized the system with Docker and orchestrated deployments using PM2
- Led API schema design, data normalization for complex Jira entities, optimizing for enterprise grade reliability.

Work Experience 2 | Software Engineering Intern at Drivool Technologies Pvt. Ltd. — Jan 2023 - Oct 2025

IoT Communication Platform with MQTT Bridge

- Deployed a Node.js server on AWS EC2 implementing industrial Modbus protocol mapping and MQTT broker communication for remote PLC control.
- Engineered a secure MQTT Architecture with load-balancing middleware, reconnection handling and topic management.
- Converted complex industrial mappings from Excel to optimized JSON structures for efficient API consumption.
- IoT Device Development: Programmed ESP32 microcontrollers in C/C++ with PubSubClient library for MQTT communication with industrial control systems for internal testing before deployment.

Project PowerTap - Cloud connected Smart Electric Meter

- Developed Android phone client (Kotlin BLE) and responsive web dashboard for real-time energy telemetry.
- Tested firmware for real time electricity monitoring.
- Focused on firmware-level debugging and functional testing to ensure reliable cloud connectivity.
- Tools/Protocols: UART, ST microcontroller, ESP32, Arduino IDE, WebSockets, Bluetooth Low Energy

Exploration and hosting of microservices on an AWS EC2 instance

- Developed and utilized multiple APIs for storing, retrieving, and deleting historical vehicle movement traces.
- Wrote cronjobs for deleting old historical data and enhanced data management for GPS-based IoT solutions.
- Implementing critical cybersecurity steps to setup SSH and reverse proxy
- Tools / Software: AWS EC2, socket programming, MongoDB.

Publications

Quantifying Modality Contributions via Disentangling Multimodal Representations

(Pre-Print on Cornell University - Arxiv Link)

- Proposed a framework based on Partial Information Decomposition (PID) for quantifying modality contributions.
- Modality contributions are quantified by decomposing predictive information in internal embeddings into unique, redundant, and synergistic components.
- Developed an algorithm based on the Iterative Proportional Fitting Procedure (IPFP) that computes layer and dataset-level contributions without retraining to enable scalable, inference-only analysis.
- This provides a principled, representation-level view of multimodal behavior, offering clearer and more interpretable insights than outcome-based metrics.
- Conducted thorough validation on synthetic data, diverse benchmarks, and models such as BLIP, LLaVA, PaliGemma and SmolVLM.

Comparative Analysis of Machine Learning Algorithms for Binary Classification of Tea Leaf Diseases

(Accepted at the 5th ICAECT | IEEE Conference in January 2025) Published paper - IEEE Xplore

- Conducted research on plant disease detection using 4 advanced machine learning algorithms.
- Utilized Python, TensorFlow, Keras, and Scikit-learn, and data visualization libraries like Matplotlib.
- Classification was done using Autoencoders, LightGBM, Self organizable maps and VGG16 for feature extraction

Projects

AWS Lambda Clone (Github) Technologies: FastAPI, Streamlit, Prometheus, Grafana, Docker, Postgres

- Built serverless execution platform mimicking AWS Lambda functionality
- Implemented isolated Python and JavaScript code execution using Docker containers
- Developed FastAPI backend with Streamlit user interface and Grafana for data visualisation
- Integrated Prometheus for metrics collection and PostgreSQL for data storage. Kubernetes for container orchestration

Multithreaded Web Server in C (trashttp) Software: C Programming, Pthreads, openSSL

- Designed to handle 1000+ client requests simultaneously.
- Implements a thread pool and a work-stealing approach with configurable scheduling like round-robin and least connections.
- Supports basic HTTP functionality, incorporating SSL encryption for secure communication.

Collaborative Skill and Project Management Platform (Github) Software: Flask, SQL, React, Javascript, HTML, CSS

- Designed RESTful APIs for user authentication, skill/project management, and collaborations.
- Flask backend, React frontend and MariaDB database.

Water-Meter (Github) Tools/Software: React Native, Android SDK

- Developed a simple water meter app for an apartments association to track and manage water level information.
- Utilized React Native for cross platform compatibility and leveraged Android SDK within Android studio.
- Designed intuitive UI and UX aligned with Material Design principles.

Cloud based attendance system using RFID Tools/Software: ArduinoIDE, ESP32-WROOM, WebSockets

- Integrated various sensors (RFID readers, LCD, keypad) and an ESP32-WROOM microcontroller
- Programmed a custom socket program that utilized the Wi-Fi capabilities of the ESP32 for real-time data transmission of attendance details
- Leveraged elastic storage capabilities of an AWS EC2 instance.

Extra Curriculars and Awards

- Semi-Finalist at **Deloitte's Hacksplosion**. Developed a mail order processing system utilizing RPA, NLP and Kafka
- Two-time recipient of the "Distinction Award Certificate" for scoring 8.5+ GPA.
- Served as Team Lead and won "Best Business Model Canvas and Prototype" for a startup idea at the Centre for innovation and entrepreneurship.
- Performed for PESU's Music club event "Evanescence". Guitarist for the band "Xuberance".

Certifications

Getting started with Jira Work Management | AWS getting started with compute | Problem Solving in C (Intermediate) | CRM (Salesforce)

Relevant Coursework:

Computer Networks, Database Management Systems, Web Technologies, Operating Systems, Machine Learning, Software Engineering, Cloud Computing, Data Structures and Algorithms, Statistics and Data Analysis, Heterogeneous Parallelism, Applied Cryptography, Object Oriented Design and Analysis, Enterprise Business Technologies, Digital Forensics, Linux, Bash Scripting, Python, Technical Writing.