APOORV RAJ

+91 9470084466 | apoorvrajmgr@gmail.com | GitHub | LinkedIn | Portfolio

SUMMARY

Software Engineer with strong foundations in Data Structures, Operating Systems, and Object-Oriented Programming, experienced in designing, developing, debugging, and enhancing scalable software applications. Proficient in building backend systems and RESTful APIs, with hands-on experience in testing, validation, and working within existing software architectures. Familiar with the Software Development Life Cycle (SDLC), including development, debugging, integration, and deployment of production-grade systems.

EXPERIENCE

Software Engineer (Independent Contractor)

Node2.io | Jan 2026 – Present | Remote (Canada)

- Designed, developed, and enhanced scalable backend software systems for real-time applications, focusing on modular architecture and low-latency processing.
- Built and maintained RESTful APIs integrated with PostgreSQL, improving API response time by ~20% and enhancing data throughput.
- Contributed to feature development and enhancements within an existing software architecture based on design specifications.
- Designed, developed, and debugged software modules according to defined design specifications.
- Identified, analyzed, and debugged software issues during development and deployment, improving system stability and reliability.
- Implemented unit testing, validation, and regression workflows to ensure correctness and performance of applications.
- Worked in Linux environments to handle system-level operations, process management, and performance optimization.
- Collaborated with cross-functional teams to define requirements, system interfaces, and performance constraints.
- Participated in code reviews and ensured code quality, maintainability, and adherence to best practices.
- Used Git for version control and contributed to structured development workflows.
- Performed issue triaging and root cause analysis to resolve bugs and improve system robustness.

ML Engineer Intern

Quicksilver Technologies Pvt. Ltd. | May 2023 – July 2023 | India

- Developed Python-based scripts for testing, validation, and debugging of software workflows.
- Built modular and reusable data processing pipelines aligned with software engineering best practices.
- Implemented unit testing and validation techniques to ensure correctness and reliability.
- Optimized data processing pipelines, improving execution efficiency and performance.

PROJECTS

Image Captioning System (CNN + Transformer, IEEE Published)

- Designed and developed an end-to-end image captioning application using a hybrid CNN + Transformer architecture for generating context-aware natural language descriptions from images.
- Built a complete data pipeline including image preprocessing, feature extraction (InceptionV3), text tokenization, and sequence modeling.
- Implemented attention-based Transformer decoder for sequence generation, improving caption quality and contextual understanding.
- Trained and evaluated the model on the COCO dataset (200K+ images) using BLEU score (~24) to validate performance.
- Compared multiple CNN backbones (VGG, ResNet, Inception) to optimize feature extraction and model accuracy.

- Optimized inference pipeline for efficient execution and reduced latency during caption generation.
- Demonstrated strong debugging, model validation, and performance tuning across training and inference stages.
- Tech: Python, TensorFlow/Keras, CNN (InceptionV3), Transformer

Heart Disease Risk Prediction System (ML + Deployment)

- Designed and developed an end-to-end machine learning application to predict heart disease risk using clinical data and multiple classification models.
- Performed data preprocessing, feature scaling, and exploratory data analysis on structured healthcare datasets (UCI dataset).
- Implemented and compared multiple models (KNN, SVM, Random Forest), selecting optimized ensemble/boosted model achieving 89.42% accuracy.
- Applied 5-fold cross-validation and evaluated performance using accuracy, precision, and AUC metrics to ensure model reliability.
- Built a real-time interactive web application using Streamlit for user input and instant prediction generation.
- Developed backend logic for prediction workflows and integrated model inference into the application.
- Performed debugging, validation, and error analysis to improve system robustness and generalization.
- Tech: Python, Scikit-Learn, Pandas, NumPy, Streamlit

Plant Leaf Disease Detection Using Deep Learning

- Developed a CNN-based classification model achieving 96% accuracy.
- Implemented image preprocessing and augmentation techniques to improve robustness and generalization.
- Designed scalable inference logic for deployment in production environments.
- Performed debugging and validation to ensure correctness and reliability of implemented features.
- Tech: Python, CNN, TensorFlow, OpenCV.

SKILLS

Programming Languages: Python, C/C++, Java (Basic)
Core Computer Science: Data Structures & Algorithms, Operating Systems, Computer Networks, OOP
Software Development: Backend Development, REST APIs, JSON, SDLC, Software Architecture
Databases: PostgreSQL, Supabase
Tools & Technologies: Linux, Git, CI/CD Pipelines, Containerization (Docker/Podman)
Testing & Debugging: Unit Testing, Debugging, Regression Testing, Validation
Cloud & Deployment: AWS (Basics), Vercel, Netlify

EDUCATION

B.E. Computer Science & Engineering

Chandigarh University • 2024 • 7.66 CGPA

CERTIFICATIONS

- **AWS Cloud Technical Essentials — AWS**
- **Machine Learning in Production — DeepLearning.AI**
- **Python for Data Science, AI & Development - IBM**

PUBLICATIONS

AI Narratives: Bridging Visual Content and Linguistic Expression

IEEE Conference Paper • IEEE International Conference on Smart Power Control and Renewable Energy • 2024