# Rohith R

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## Summary

Final-year Computer Science and Engineering student with strong expertise in Computer Vision and Deep Learning. Proficient in Python, PyTorch, TensorFlow, and OpenCV with hands-on experience building end-to-end computer vision pipelines. Developed real-world CV projects including real-time pothole detection using Faster R-CNN, autonomous driving behavioral cloning with CNNs, and predictive analytics systems. Skilled in object detection, image preprocessing, feature extraction, data augmentation, and model deployment. Strong foundation in neural network architectures, transfer learning, and production-ready computer vision applications.

## Technical Skills

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| **Computer Vision** | OpenCV, Object Detection, Faster R-CNN, Feature Pyramid Networks (FPN), Image Classification, Image Preprocessing, Data Augmentation, Bounding Box Regression, Region Proposal Networks |
| **Deep Learning** | PyTorch, TensorFlow, Keras, CNNs, ResNet, Transfer Learning, Model Fine-tuning |
| **Programming** | Python, C++, Java |
| **ML/Data Science** | Scikit-learn, Pandas, NumPy, Matplotlib, Statistical Analysis, SQL |
| **Tools & Platforms** | Git, GitHub, Docker, Gradio, Hugging Face Spaces, VS Code, Jupyter Notebook, Google Colab |
| **Core CS** | Data Structures & Algorithms, DBMS, Operating Systems |

## Projects

**Real-Time Pothole Detection System** — GitHub — Live Demo

- Developed object detection system using Faster R-CNN with ResNet50-FPN backbone in PyTorch for automated road damage identification
- Trained on 665 images (1,319 annotations) achieving 62.9% AP@50 and 76.5% Recall with transfer learning from ImageNet
- Implemented data augmentation and preprocessing pipeline using Albumentations and OpenCV for improved model robustness
- Deployed as interactive web application using Gradio and Docker on Hugging Face Spaces with real-time inference

**Autonomous Driving using Behavioral Cloning (CNN-based)**

- Built CNN-based behavioral cloning model using TensorFlow/Keras to predict steering angles from camera images in real-time
- Processed and augmented 90,000+ driving images with OpenCV for cropping, normalization, and color space conversion
- Implemented data augmentation including flipping, brightness adjustment, and shadow simulation to reduce overfitting
- Achieved smooth lane navigation in Udacity self-driving car simulation environment

**Heart Disease Prediction using Machine Learning**

- Built end-to-end ML pipeline with multiple classifiers (Logistic Regression, Random Forest, SVM) using Scikit-learn
- Performed preprocessing including outlier removal (IQR), multicollinearity analysis (VIF), and feature scaling
- Achieved optimal performance with Logistic Regression (F1=0.89, Recall=0.92, AUC=0.94) for healthcare prediction

## Internships

**Machine Learning Intern – Enterprise Building Training Solutions (EBTS)** May–June 2025

- Built end-to-end ML pipeline for Heart Disease Prediction on 1,025 patient records using Python and Scikit-learn
- Performed data preprocessing including outlier removal, multicollinearity analysis, feature scaling, and EDA
- Trained and evaluated multiple models with comprehensive metrics: accuracy, precision, recall, F1-score, ROC-AUC
- Identified model overfitting through cross-validation and selected optimal classifier for deployment
- Strengthened practical skills in ML workflow design, model evaluation, and data-driven decision making

## Education

**B.Tech in Computer Science and Engineering** 2022–2026
Cochin University of Science and Technology (CUSAT) CGPA: 9.03

**Higher Secondary Education (Bio-Science)** 2019–2021
BJSM Madathi HSS

**SSLC** 2018–2019
BJSM Madathi HS

## Certifications

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|---|---|---|
| Machine Learning Internship Certificate | Enterprise Building Training Solutions (EBTS) | 2025 |
| Google AI Essentials | Coursera (Google) | 2025 |