

# BALAGOPAL M

📍 Kochi, Kerala    ✉ baluu1603@gmail.com    ☎ 8137004697    in Balagopal M

## Summary

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Aspiring Application Developer with a background in Electronics and Communication Engineering and hands-on experience in AI, machine learning, computer vision, and Flutter-based app development. Seeking opportunities in roles like Application Developer, Software Engineer, or ML Engineer. Passionate about solving real-world problems through emerging technologies.

## Skills

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### Soft Skills

- Team Work, Adaptability, Leadership, Time Management
- Critical Thinking, Problem-Solving, Attention to Detail
- Initiative, Research & Technical Documentation

### Technical Skills

- Programming Languages: Python, Java, C, Dart, HTML, CSS, JavaScript, SQL, PHP
- Machine Learning & AI: Model Development, Data Preprocessing, Explainable AI (Grad-CAM), Model Evaluation
- Deep Learning Frameworks: TensorFlow, Keras, PyTorch
- Computer Vision: Image Classification, Object Detection, Pose Estimation
- Data Analysis & Visualization: NumPy, Pandas, Matplotlib
- App & Web Development: Flutter, Flask, Firebase, phpMyAdmin
- Databases: MySQL, Firebase

### Tools

- Version Control: GitHub
- IDEs & Editors: VS Code, Jupyter Notebook, Android Studio
- Visualization: Matlab
- Cloud & Deployment Platforms: Google Colab, Render
- Mobile Development & Debugging: Flutter DevTools

## Education

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**Adi Shankara Institute of Engineering and Technology**, Electronics and Communication Engineering

May 2021 – May 2025

- GPA: 7.56/10

**Saraswathi VidyaNikethan**, Senior Secondary Education

March 2020 – March 2021

Percentage: 88

• **Saraswathi VidyaNikethan**, Secondary Education

March 2018 – March 2019

- Percentage: 88

## Training/Courses

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- **Machine learning and data science**
- **Advanced deep learning for computer vision**
- **Embedded System and Robotics**
- **Introduction to drone technology**

## Internships

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1. **Embedded Systems And Robotics**, TechMaghi
2. **Python Programming**, CodeAlpha
3. **Basics of Robotics**, Kodachy
4. **Full Stack Development**, Unified Mentor

## Projects

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### **Deepfake Video Detection System With Explainable AI**

- Trained and fine-tuned XceptionNet using transfer learning and early stopping, achieving high accuracy in detecting deepfakes.
- Integrated Grad-CAM for XAI, enabling heatmap generation to highlight manipulated facial regions.
- Evaluated model performance with precision, recall, F1-score, achieving reliable detection against Celeb DF V2
- Tools & Technologies: Python, VS Code, TensorFlow, Keras, XceptionNet, Grad-CAM, OpenCV, HTML, CSS, JavaScript

### **Real Vs AI Generated Image Detection Using Machine Learning**

- Built an image classifier with EfficientNet achieving 97% accuracy across 10 classes.
- Improved detection reliability in single-object environments with future scope for multi-object and video deepfake detection.
- Tools & Technologies: Python, VS Code, EfficientNet, NumPy, HTML, CSS, JavaScript

### **Advanced Fracture And Tumor Detection System**

- Collaborated on an ML system to detect fractures and tumors from X-ray scans.
- Contributed to data preprocessing, evaluation, and implementation phases using ML workflows.
- Tools & Technologies: Python, VS Code, Scikit-learn, NumPy, Pandas, OpenCV, HTML, CSS, JavaScript

### **Real-Time Fall Monitoring and Alert System**

- Developed a real-time fall detection system using YOLOv8 and posture angle analysis to identify human falls
- Implemented logic to monitor immobility for a customizable duration (e.g., 30 seconds) and integrated Twilio API to send emergency SMS alerts
- Tools & Technologies: Python, OpenCV, YOLOv8, TensorFlow, NumPy, Twilio API, MovNet, playsound, Real-Time Video Processing

### **Human Follower System**

- Built a real-time human tracking system by integrating YOLOv8 for person detection and MoveNet (TFLite) for pose estimation.
- Implemented distance and steering angle estimation using camera calibration and shoulder keypoints.
- Designed smoothing filters, lock and unlock logic, and stability enhancements for robust tracking.
- Developed an OpenCV-based UI displaying live telemetry including angle, distance, direction, and proximity warnings.
- Tools & Technologies: Python, OpenCV, TensorFlow Lite, Ultralytics YOLOv8, NumPy, VS Code

### Executive CRM Chatbot

- Developed and deployed an intelligent CRM chatbot using Rasa and Django to handle clients, inquiries, leads, orders, and follow-ups via natural conversations.
- Designed and curated extensive NLU training data (intents, entities, and stories) to improve intent classification and entity extraction accuracy.
- Implemented backend actions in Python with Django and MySQL for case-insensitive queries, client detail retrieval, inquiry tracking, and follow-up scheduling.
- Tools & Technologies: Python, Rasa, Django, MySQL, Tailwind, VS Code

### Finance Tracker Application

- Developed an offline finance tracking application enabling users to manage budgets, expenses, and savings efficiently with local data storage through SQLite.
- Implemented an alert and notification system for budget overages, while focusing on responsive and intuitive UI/UX across multiple devices.
- Tools & Technologies: Dart, Flutter, Android Studio, VS Code, HTML, CSS, JavaScript

### LingoDefine – Flutter-Based Translator and Dictionary App

- Developed a mobile app for translation and word definition with offline support.
- Focused on cross-device UI responsiveness and real-time language switching.
- Tools & Technologies: Dart, Flutter, Android Studio, Flutter DevTools, HTML

### Hospital Management System

- Engineered a multi-role hospital system for doctors, patients, and administrators with secure login.
- Focused on secure session handling, data validation, and user-friendly interfaces with dynamic form handling and real-time updates.
- Tools & Technologies: HTML, CSS, JavaScript, PHP, SQL, Firebase, phpMyAdmin, VS Code

### Gym Management System



- Built a responsive web app to handle gym member registrations, schedules, and payments.
- Focused on building a responsive interface with smooth navigation and real-time data updates using Firebase and structured data management with SQL.
- Tools & Technologies: HTML, CSS, JavaScript, PHP, SQL, Firebase, phpMyAdmin, VS Code

### Python ChatBot

- Developed a terminal-based chatbot to provide real-time time-related responses using the datetime module.
- Focused on beginner-friendly structure and clean logic.
- Tools & Technologies: Python, Google Colab, datetime module

## References

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