J. Keshav Bhupathy Vignesh

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Result Oriented Software Developer with nearly **2** years of hands on experience in designing, developing, testing and maintaining backend system applications, primarily in Python along with notable frontend development experience.

RELEVANT WORK EXPERIENCE

Senior Software Engineer, Wipro Limited

Autonomous Robots Research Team, Chief Technology Office
September 2019 – Present
Bengaluru, Karnataka, India

1. **Robotics Software platform**
   Project Description *– A collection of reusable Python Libraries and Microservices that can be used to prototype, test and deploy Multi level Orchestration systems for various Robotic use cases agnostic of actual hardware*
   - Created various **REST API** endpoints using **Django** and also automated testing using **Postman**
   - Implemented the **communication framework** for the platform using **ZeroMQ**
   - Automated the build-test-deploy cycle of the development using **Jenkins** to reduce development testing time
   - Created detailed architecture design diagrams for the system
   - Developed the platform core using concepts such as **design patterns** and **Dependency Injection**
2. **Robot – Camera Calibration Tool**
   Project Description *– A GUI Tool, that can be used to collect ARUCO marker data from captured images and calibrate any Robot Arm with any chosen Camera*
   - Proposed and Developed this tool, which simplifies the manual workflow involved in Robot Hand-eye calibration
   - The tool **reduces the total process time** from 3 hours to 15 minutes
   - Designed the Interface using **Qt Designer** and programmed the workflow and calibration algorithm using **Python**
   - ARUCO pose estimation was implemented using **OpenCV**
   - **Dockerized** as well as created a **Snap app** for the Application deployment

Project Engineer, Wipro Limited

Autonomous Robots Research Team, Chief Technology Office
July 2018 – August 2019
Bengaluru, Karnataka, India

1. **Web Based Monitoring and Control System for the Retail Robot**
   Project Description *– A remote Monitoring and Control System that can be used to setup, configure and control a robot deployed in a shop floor or warehouse for a retail use case involving a Mobile Robot*
   - Developed a dynamic and interactive website used for monitoring and control using **HTML5, Jinja2 Templating, Bootstrap and JQuery**
   - Implemented the Server using **Flask** and various **REST API** endpoints for the same
   - Setup the database using **MySQL** and setup server bindings using **SQLAlchemy**
   - Created a **Flask – ROS interface** for communication with the Robot
2. **High level Orchestration System for the Retail Robot**
   Project Description *– A ROS Based Orchestration System that is used to get data from the various nodes of the robot and make future decisions*
   - Implemented a **State Machine based Orchestrator** in **Python using ROS** for Optimal Decision Making
   - Defined and implemented synchronization and data sharing protocols between the hardware systems and the Orchestrator
   - Setup Communication Interfaces with External Nodes Using **ActiveMQ**
3. **Simulation Environment for the Retail Robot**
   Project Description *– A ROS Based Simulation environment that can be used to develop and test the various modules developed for a retail use case involving a Mobile Robot*
   - Implemented the **control APIs** required for the virtual environment including Robot and camera controls using **Python and ROS**
   - **Dockerized** the application for use across systems
   - Modelled the necessary sensors and components in **Gazebo** and configured the same in SDF – An XML configuration format

TECHNICAL SKILLS

Python, C/C++, HTML5, CSS, Javascript, Django, Flask, Robot Operating System (ROS), PostgreSQL, MySQL, ZeroMQ, Docker, Snapcraft, Postman, Jenkins, Qt Designer, Git, Angular

EDUCATION

Bachelor of Technology in ***Computer Science and Engineering*** *from* ***Vellore Institute of Technology (VIT), Chennai Campus***

June 2014 – March 2018, Chennai — *CGPA: 9.23 / 10.00*

PERSONAL PROJECTS

- A physical chessboard that the user can play with, without the need of an opponent. The opponent pieces move by themselves. There are no visible moving mechanisms
- **Ecosense** – A Smart Home Energy Control and Management System

LANGUAGES

English, Tamil, Malayalam