J. Keshav Bhupathy Vignesh

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.

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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
- A Game theoretical approach to prevent Network Congestion in sensor networks

LANGUAGES

English, Tamil, Malayalam

OTHER INTERESTS

Filmmaking, Magic, Visual FX, Game Development