Virbhadrappa**Kalburgi**

Robotics and Automation

Interests

Robotics, Machine learning, AI, Reinforcement Learning, Drones, Quad-Copters, Mobile Robots, Social Robots, Neural Network for Robots, Swarm Robot.

Education

2020 · **M.Tech Robotics and Automation**
Amrita Vishwa Vidyapeetham School of Engineering Amritapuri

2017 · **B.E Electronics and Telecommunication**
SKN Sinhgad College ofEngineering Solapur, University Solapur

2013 · **Diploma Electronics and Telecomunication**
S.V.S.M.D's Polytechnic Akkaklot, Mumbai board

Experience

2018-19 · **Rakuten Institue of Technology (RIT), Rakuten Bengaluru**   Research Intern
As a Research Intern, I worked on Follow behavior robot for last-mile delivery, using the ROS and Machine learning to improve e-commerce.

2018 · **Computational Neuroscience and Neurophysiology Labs, Amritapuri**
Intern
As an Intern, I worked on robotics arm, which works on spiking CMAC using Izhikivch model. This work helps to study and understand how a human neuron works to perform any task.

About

Madha colony,
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Portfolio
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Languages

English,Hindi,Marathi and Kannada(s)

Programming

 ROS
C, C++
MATLAB
Python
Machine Learning
Deep Learning
Arduino.

Education project

2019	**Adaptive Control system design for insect type legged robot** **Problem statement** Getting the robot stability of legged robot in all terrain area without losing the balance it is very difficult also the surface of the area effect force distributed consuming of the robot. Getting more stable and low power consuming robot is very important while wanting to surveillance of dangers and harmful area such as a tunnel. **Solution** Adaptive controller using ROS for insect type robot with low power consuming and challenge facing like obstacle avoiding without losing robot balance and stability in given environment. ros_controller_manager is helps to manage the each controller which used in the robot to control locomotion of legs.With help of the imu data make robot stable waking.
2018	**Implementation of spiking CMAC neural model to control robotic arm** **Problem statement** How neural microcircuits of human brain comprised of spiking neurons exhibit complex dynamic stable coordinated motor movements can be implemented for robot arm that contributes to motor coordination, timing and precision of movements and to develop a model from the results to understand biological cerebellar pathways responsible for such functions? **Solution** Using the Izhikivch model and CMAC model implemented Spiking CMAC for control 2 DOF robotic arm.

Key strength

Taking leadership,
Confident,
Accept new
challenges,
Willing of learning new
thing.

Software Skills

MATLAB Simulink
GAZEBO Simulator
V-REP simulator
Moveit Simulator
Carla Car Simulator
RoboAnalyzer
ABB Robot Studio

Hobbies

Listening to music,
Playing cricket
Traveling
Bicycling
Explore new place

Publication

2019	**Control system design for four-legged walking robot with insect type leg using ROS** **Journal: materials today proceedings 2019** **Abstract** This work presents the development of a control algorithm for an insect type four-legged robot which contains hips, torso and legs joints. The mechanical design is inspired by the locust insect. ROS is adapted because it provides a reliable mechanism for fast robot development and algorithm reuse. We presenting the control algorithm which helps to robot get stable and balanced walking locomotion in a given environment, also able to perform task like avoiding static obstacles. This control algorithm is validated in a simulation environment GAZEBO, RVIZ.

Specialization Courses

2020   **Reinforcement Learning Specialization by University of Alberta** Coursera

The Reinforcement Learning Specialization consists of 4 courses exploring the power of adaptive learning systems and artificial intelligence (AI). In this specialization, I learned: Build a Reinforcement Learning system for sequential decision making; understand the space of Reinforcement Learning algorithms understand how to formalize a task as a Reinforcement Learning problem, and how to begin implementing a solution; understand how RL fits under the broader umbrella of machine learning.

2020   **Self Driving Cars Specialization by University of Toronto**   Coursera

This Specialization gives you a comprehensive understanding of state-of-the-art engineering practices used in the self-driving car industry. By interacting with real data sets from an autonomous vehicle (AV), you'll implement methods for static and dynamic object detection, localization and mapping, behaviour and maneuver planning, and vehicle control all through hands-on projects using the open source simulator CARLA. You'll learn from a highly realistic driving environment that features 3D pedestrian modeling and environmental conditions. When you complete the Specialization successfully, you'll be able to build your own self- driving software stack and be ready to apply for jobs in the autonomous vehicle industry.

2020   **DeepLearning.AI TensorFlow Developer Specialization by Deeplearning.ai**   Coursera

DeepLearning.AI TensorFlow Developer Professional Certificate program. As part of this Professional Certificate program, I have learned: how to build and train neural networks using TensorFlow, how to improve network performance using convolutions as you train it to identify real-world images, how to teach machines to understand, analyze, and respond to human speech with natural language processing systems, and more!.

2020   **Deep Learning Specialization by Deeplearning.ai**   Coursera

The Deep Learning Specialization is designed to prepare learners to participate in the development of cutting-edge AI technology, and to understand the capability, the challenges, and the consequences of the rise of deep learning. Through five interconnected courses, learners develop a profound knowledge of the hottest AI algorithms, mastering deep learning from its foundations (neural networks) to its industry applications Computer Vision, Natural Language Processing, Speech Recognition, etc.

Technical Project

| 2020 | **Toy collecting robot using AI and ROS** | Coding |

This project is focusing on collecting toys from the floor, using AI, deep learning and ROS. Detect and recognize toys and drop in dropbox. This robot navigation using SLAM.

| 2020 | **Dorna Robotics ARM using ROS** | Coding |

This project is focusing on Simulation of robotics arm in GAZEBO simulation environment using ROS. Performing tasks such as pick up objects, open-door, click the lift button.

| 2020 | **Outdoor Way-point Navigation with Husky Robot using ROS** | Coding |

This project is focusing on outdoor navigation of husky robot using GPS, IMU and LIDAR sensor and ROS. Also focusing on terrain detection so it can drive in any terrain. The simulation is done in the Gazebo simulation environment.

| 2020 | **Warehouse Robot using AI** | Coder |

This project is focusing on the design AI model for warehouse robot, finding the desired goal point with avoiding obstacle function.

| 2017 | **UFV Drone** | Team-leader |

A drone that can fly and walking on ground surface using the 6 channel Rf remote controller, It also detect the obstacle and human beings using some sensors.

| 2016 | **ROBOCON 2016** | Coder and Designer |

Clean Energy Recharge the world this is the theme we have to place wind turbine propeller on wind turbine motor using climbing robot.That robot is self controlled and balancing robot.

| 2015 | **ROBOCON 2015** | Team-leader |

Badminton playing robot as it is theme of the Robocon2015,to control the robot we use wireless controller and closed loop motor control system to played the shuttlecock.

Achievement

>> National level computation in ROBOCON2016 MATLAB workshop winner
>> Second price in innovation project which is conduct by COEP college pune
>> Delivered a workshop on Arduino at SKN Sinhgad College of Engineering Pandhapur

Extra curricular activities

>> Participated in ROBOCON 2015
>> Participated in ROBOCON 2016
>> Conducted workshop on Arduino
>> Participated in MATLAB Workshop 2016
>> Participated in university level paper presentation 2017