

VirbhadrappaKalburgi

Robotics and Automation



About

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Portfolio

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Github

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Languages

English,Hindi,Marathi
and Kannada

Programming

ROS

C, C++

MATLAB

Python

Machine Learning

Deep Learning

Arduino.

Objective

Highly skilled Robotics Navigation Researcher with a strong background in ROS, CPP Python, OOP, state machines, point cloud-based mapping, localization, and precise control for robot navigation. Seeking a challenging position in a progressive research environment where I can leverage my expertise to contribute to the development and advancement of autonomous robot navigation systems.

Education

- 2020 **M.Tech Robotics and Automation**
Amrita Vishwa Vidyapeetham School of Engineering Amritapuri
- 2017 **B.E Electronics and Telecommunication**
SKN Sinhgad College of Engineering Solapur, University Solapur
- 2013 **Diploma Electronics and Telecommunication**
S.V.S.M.D's Polytechnic Akkaklot, Mumbai board

Experience

- 2023-NOW **Singapore University of Technology and Design** **Robotics Research Associate**
I work as a Robotics Researcher at Singapore University of Technology and Design. My main goal is to create sustainable solutions for the challenges of mobile robot navigation and Autonomous Vehicles. I'm dedicated to making significant contributions in this field, aiming to improve the efficiency and effectiveness of robotic navigation and Autonomous Vehicles in ways that prioritize sustainability.
- 2021-2023 **Singapore University of Technology and Design** **Senior Robotics Research Associate**
I am employed as a Robotics Researcher at Singapore University of Technology and Design, where my primary focus is on developing and inventing sustainable solutions for the mobile robot navigation problem. My role involves making valuable contributions to the field, ensuring that we can enhance the efficiency and effectiveness of robotic navigation in a sustainable manner.
- 2021 **The Hi-Tech Robotic Systemz Ltd** **Robotics Software Engineer**
I am working on Mobile Robots, My role is develop and deploy ROS Software in Mobile Robot. Developing SLAM and Path Planning Algorithms.

2018-19 **Rakuten Institute 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**
Student 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.

Education project

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
Object-Oriented
Programming and
Design
Robot Localization
Techniques
Sensor Fusion (LiDAR,
RGB-D cameras,
IMUs)
Simultaneous
Localization and
Mapping (SLAM)

Hobbies

Listening to music,
Playing cricket
Traveling
Bicycling
Explore new place

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.

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 has 4 courses, exploring adaptive learning systems and AI. I learned to build RL systems for decision making, formalize tasks as RL problems, and understand its relation to machine learning..

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

This Specialization provides a comprehensive understanding of self-driving car engineering using real data sets from an autonomous vehicle. You'll learn various methods for detection, localization, planning, and control through hands-on projects with CARLA simulator. After successful completion, you'll be equipped to build your self-driving software and pursue jobs in the autonomous vehicle industry.

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

In the DeepLearning.AI TensorFlow Developer Professional Certificate, I learned to build and train neural networks with TensorFlow, improve network performance using convolutions for real-world image recognition, and create natural language processing systems for understanding and responding to human speech.

2020 **Deep Learning Specialization by DeepLearning.AI** Coursera

The Deep Learning Specialization prepares learners for AI development and understanding the power and challenges of deep learning. It covers fundamental neural networks to real-world applications like Computer Vision, Natural Language Processing, and Speech Recognition.

Achievement

- >> Winner in ROBOSOFT2023 competition organized by IEEE Robotics and Automation
- >> National level computation in ROBOCON2016 MATLAB workshop winner
- >> Second prize in innovation project which is conducted by COEP college pune
- >> Delivered a workshop on Arduino at SKN Sinhgad College of Engineering Pandhapur