**PAWAN WADHWANI**
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## EDUCATION

| Year | Examination | Institution | Grades/Percentage |
|---|---|---|---|
| 2022 | B.Tech Computer Science | SRMIST, Kattankulathur | CGPA – 9.66 |
| 2022 | Minor Robotics | SRMIST, Kattankulathur | CGPA – 8.32 |
| 2018 | XII | Choithram School, CBSE | 87.2% |
| 2016 | X | Choithram School, CBSE | CGPA – 10.0 |

## SKILLS

**Programming Languages:** C/C++, Python, Lua, Bash/shell
**Tools**: Docker, CMake, Jenkins, Qemu, git
**Libraries:** NumPy, Tensorflow, Darknet, Pytorch
**Frameworks:** ROS, ROS2, Robocomp, Aerostack2
**Robotics Simulation:** Rviz, Gazebo, CoppeliaSim
**Microcontrollers/Dev boards:** STM32, ESP32, Jetson TX2, Jetson Nano, various Arduino boards
**Areas of Interests:** Robotics, Mobile Robots, Socket Programming, Deep Learning, Microcontrollers, Linux kernel Development, Software Architecture Development.

## EXPERIENCE

**Cradlepoint India Pvt. Ltd.** **(Jan'22 – Present)**

**SDE – Platform Firmware Team** **(June'22 – Present)**

- Upgraded Linux kernel from 4.4 to 5.4 on Cradlepoint devices to enhance driver capabilities, enhance security, and improve system performance.

**SDE Intern – Platform Firmware Team** **(Jan'22 – May'22)**

- Spearheaded the design and implementation of a Link Layer Discovery Protocol for power negotiation on Cradlepoint Devices, resulting in improved power management and increased capacity to support additional devices.

**Google Summer of Code** **(May'23 – Sep'23)**

**Open Source Contributor - JdeRobot**

- Led migration of Robotics Academy docker image (RADI) from ROS Noetic to ROS2 Humble Hawksbill for enhanced longevity.
- Successfully transitioned drone exercises to ROS2 utilizing the Aerostack2 framework.
- Optimized Docker image size and explored hardware acceleration for improved performance.
  https://summerofcode.withgoogle.com/programs/2023/projects/4YgccDJg
  https://bit.ly/GSoC-Report-Pawan-Wadhwani

**Green Quest Solutions** **(Jan'21 – Mar'21)**

**ROS Developer**

- Contributed to the design and manufacturing of a 3-degree-of-freedom delta robotic arm for industrial applications.
- Integrated a machine learning model (YOLO v4) for waste classification with the robotic arm and conveyor system.
- Achieved efficient waste segregation with a cycle time of up to 3 seconds per object through seamless integration of the machine learning model.
  https://bit.ly/Delta-Robot-Waste-Segregation

**Samsung PRISM** **(Aug'20 – Dec'20)**

**Student Researcher**

- Conducted analysis and benchmarking of 10 adversarial attack-defense pairs on Open Image and CIFAR-10 datasets.
- Developed a defense mechanism to enhance the robustness of Deep Neural Networks against adversarial attacks.
- Undertook this project under the mentorship of experts from Samsung, gaining valuable insights into practical applications of defense strategies in the field of deep learning.

## PROJECTS

**Zutu: Swarm Robots Localization and Navigation**

Contributed to the development of Zutu, a low-cost, modular platform for swarm robot research at my university. Implemented a unique monocular camera-based localization technique, assessing its resilience to obstructions and camera disturbances. Deployed on ESP32 with ROS Melodic and simulated in CoppeliaSim. https://youtu.be/ESO9nx7IlDA

**Mars Rover Prototype**

Created a Mars Rover prototype for University Rover Challenge and Indian Rover Challenge, featuring a 6-DOF robotic arm. Achieved manual and autonomous traversing up to 1 km using ROS Melodic, ReactJS GUI, and STM32 embedded system. https://youtu.be/2gt8fW8TD7c

## PATENTS

**Smart watch for covid-19 detection**

The team designed a smart watch to be used in industries to detect anomalies in health of employees by using a proprietary algorithm using heart rate and sampled temperature.

**patent application no. 202021032594; date of filing: 30/07/2020**

**Social Distancing Pendant**

Developed a Bluetooth-enabled pendant addressing social distancing concerns during the COVID pandemic. Utilized RSSI values to calculate distances between devices

**patent application no. 202021032595; date of filing: 30/07/2020**

## PUBLICATIONS

- Prateek, **W. Pawan**, P. Reshesh, B. Mayur, V. Helen," **Zutu: A Platform for Localization and Navigation of Swarm Robots Using Virtual Grids**" Presented in *7th International Conference on Robotics and Automation Engineering (ICRAE)*, Singapore (Nov 2022) https://doi.org/10.1109/ICRAE56463.2022.10056169

## ACHIEVEMENTS

- People's Choice award and grant of AUD$750 (Rs.43,000) in Technology Infusion Grand Challenge Asia.
- Asia Rank 1 and World Rank 3 in Indian Rover Challenge 2020, Team was awarded Rs. 25,000 – Team RUDRA - SRM Mars Rover
- Asia Rank 2 and World Rank 11, University Rover Challenge 2019 – Team RUDRA - SRM Mars Rover
- Three-time recipient of SRM Academic Excellence Scholarship.
- Rank 1 in the international finale of International Robotics competition 2017 held in Beijing, China.
- Rank 1 in the National finale of International Robotics Competition 2016, Team was awarded a sponsored trip to Beijing China to compete in the international finale.

## POSITIONS OF RESPONSIBILITY

- Technical Director – Team RUDRA SRM Mars Rover (2021-2022)
- Team Lead – Robotics Team Choithram School (2016-2017)