VANSH RAI SAINI

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EDUCATION

INDIAN INSTITUTE OF TECHNOLOGY, JAMMU (IIT JMU) **Jammu & Kashmir, India**

Bachelor of Technology in Mechanical Engineering ***; CGPA 8.47/10.0*** **2019 - 2023**
Minor Degree in Computer Science **2019 - 2023**

RELEVANT COURSEWORK: Sensors, Actuators, and Instrumentation; Machine Learning; Deep Learning; Computer Vision; Data Structures and Algorithms, Probability and Stochastic processes

WORK EXPERIENCE

Unbox Robotics, Robotics Software Developer, Pune, India **May 2023– Present**

- Maintainer of the Task Manager module that uses State Machine to plan the robot tasks in a multi robot system. Part of the team that is refactoring the module to substitute state machines with behavior trees.
- Developed an algorithm that automatically dispatches a robot to the charging grid when its State of Charge is low while also maintaining the throughput required.

Machine Learning Research Intern, IIT Jammu, India **July 2022-March 2023**

- Applied machine learning methods, including **random forest**, **SVM,** and **ANN,** to predict the location of critical heat flux in an annular pipe with a limited dataset. Paper submitted for review.
- Employed **Wasserstein GANs** to generate more training data and feature selection methods of mRMR and PCA to achieve optimum results. Achieved an R2 score of **0.90** with SVM and **0.9404** with ANN

PROJECTS

Autonomous Weeding Robot **[B.Tech. Project. IIT Jammu, India]** **Team Size: 4**
Role: Team Lead **Aug 2022-May 2023**

- Developed a computer vision model to differentiate between Weeds and Cotton Plants using **Yolo V5**(transfer learning) using a custom dataset. Deployed the model using Raspberry Pi 4.
- Designed and assembled the entire mechanical and electrical subsystem from scratch

Smart Stick and Glasses for Visually Impaired **[IIT Jammu, India]** **Team Size: 6**
Role: Team Member **Aug 2021 – Apr 2022**

- Built a face detection and recognition model using **Siamese networks** and integrated it the smart glasses using Raspberry Pi 4 to detect and recognize human faces in real-time
- Deployed an image-to-speech **OCR** model using **the pyTesseract** library to capture text from real-time feed and output it as speech.

Quadruped for mine detection **[IIT Jammu, India]** **Team Size: 20**
Role: Team Member **Jan 2021 – Jul 2021**

- Developed IIT Jammu's inhouse Quadruped robot (12 DoF) inspired by **MIT's Spot Micro**. Involved with custom **CAD design & FEA analysis, 3d printing prototypes,** powertrain design and **Gazebo Simulation**. Integrated IMU data via Arduino

PRACTICAL SKILLS

Programming Languages & Developer tools: C++, Python, Linux, Docker, Git, CMake
Technical Libraries: Scikit learn, OpenCV, Tensorflow, Pytorch
Miscellaneous: ROS, ROS2, Gazebo, MATLAB, Ansys, SOLIDWORKS

POSITION OF RESPONSIBILITY

- **Convenor of Technunctus** 2k22 – organized the annual tech fest of IIT Jammu which witnessed a footfall of over 4000 people. Planned and executed of 15+ technical workshops.
- **Captain of Team Kinesis – Led 20 member Team Kinesis**, which designed and fabricated an electric all-terrain vehicle(ATV) for SAEINDIA eBAJA 2k22. Oversaw the integration of all subsystems of the ATV as the team captain

ACHIEVEMENTS

- Awarded the **UPSTSE** (UP Science Talent Search Examination) Fellowship by Govt. of Uttar Pradesh(2018)
- Secured **All India Rank 9286** in JEE Advanced among 900k applicants.(2019)