Hardaat Singh Baath

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LinkedIn

GitHub

Website

EDUCATION

B.E. in Computer Science
Birla Institute of Technology and Science, Pilani
November 2021 – present
Sancoale, Goa, India

SKILLS

Programming Languages
C, C++, Python, Java, MATLAB

Libraries
Numpy, Matplotlib, Pandas, Seaborn, OpenCV, Scikit-learn

Framework
ROS, PyTorch, Tensorflow, Keras

Tools
Gazebo, CoppeliaSim, Git and GitHub

Soft Skills
Public Speaking, Canva, Creative Writing

Languages
English, Hindi, Punjabi

RELEVANT COURSES

Computer Programming | Data Structures and Algorithms | Database Management Systems | Operating Systems | Network Programming | Probability and Statistics | Linear Algebra | Differential Equations | Multivariate Calculus | Machine Learning

Online Courses
- AMRx: Autonomous Mobile Robotics, ETH Zurich
- CS231n Stanford Computer Vision
- IBM AI Engineering Specialization (ongoing)

RESEARCH EXPERIENCE

CSIR - CEERI, Pilani
Research Intern
June 2023 – August 2023 | Pilani, Rajasthan, India
- Advisor: Dr. Dhiraj Sangwan
- Developed a novel pipeline utilizing Deep Learning techniques to generate, segment, and restore Rajasthani Wall Murals.

PUBLICATIONS

Damage Segmentation and Restoration of Ancient Wall Paintings for Preserving Cultural Heritage
International Conference on Computer Vision and Image Processing, 2023
Hardaat Singh Baath, Soham Shinde, Jinam Keniya, Priyanshu Ranjan Mishra, Anil Saini, Dhiraj Sangwan

PROJECTS

Project Kratos, A Mars Rover
Club Project
May 2023 – present
- Worked on a **P-controlled visual servo** algorithm to follow Arrow and ArUco tags detected using **YOLOv3, OpenCV** and **Python**.
- Implemented **RTK-GNSS-based GPS** coordinates system and **PID-based** algorithm to navigate to the specified points.
- Implementing **Probabilistic Terrain Mapping** algorithm using Point Clouds, Pose Estimates and Transformations.
- Implementing **global and local path planning algorithms** for autonomous navigation using Zed 2i camera and Jetson Xavier AGX.

Deep Learning Techniques for Damage Restoration
Supervised Project
June 2023 – August 2023
- Advisor: Dr Dhiraj Sangwan
- Developed a DL-based pipeline for damage generation, segmentation and restoration of Rajasthani Wall Murals.
- Used models like **StyleGAN2-ada-PyTorch** for damage generation, **UNet++** and **DeepLabV3+** for damage segmentation and **AOT-GAN** and **Partial Convolutional Network** for image inpainting.

Using Haar Wavelets for Mapping
Supervised Project (ongoing)
September 2023 – present
- Advisor: Dr Amit Setia
- Designing and implementing a mapping and path planning algorithm for drones utilizing the **Haar wavelets** model.