Hardaat Singh Baath

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EDUCATION

B.E. in Computer Science
Birla Institute of Technology and Science, Pilani ⊡
November 2021 – present
Sancoale, Goa, India
- *CGPA: 7.45*

SKILLS

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

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

Framework
ROS, PyTorch, Tensorflow, Keras

Tools
Gazebo, CoppeliaSim, Docker, AWS, 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 | Computer Networks | Computer Architecture | Probability and Statistics | Linear Algebra | Differential Equations | Multivariate Calculus | Machine Learning | Brain Inspired Deep Learning

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

AWARDS

Excellence Award (Overall)
Internation Rover Challenge, Bangalore
January 2023
- Won Best Overall Rover award.
- Stood 2nd in the Autonomous Challenge and 4th overall.

RESEARCH EXPERIENCE

AI Engineer
DG Takano ⊡
May 2024 – present | Japan (Remote)
- Successfully **automated** the product testing line to enable remote operation and real time data monitoring.
- **Integrated with Cloud Service** for data storage and analysis.

Research Intern
CSIR - CEERI, Pilani ⊡
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.

LSTM for Stock Market Prediction
Supervised Project (ongoing)
February 2024 – present
- Advisor: Dr. J K Sahoo ⊡
- Exploring and implementing an **LSTM-based time series algorithm** for Stock Market Prediction using features like **Signal line, MacD line, EMA** etc with feature extraction using CNN-based Liquid Neural Network.
- Implementing a trading algorithm with transaction costs and taxation for realistic simulation of stock markets using Nifty 50 dataset.