Avishkar Arjan

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Research & Work Experience

Indian Institute of Technology, Delhi **Delhi, India**
Research Project *Dec 2023 - Feb 2024*

- Guide: Dr. Subodh Kumar, CSE Dept. IIT-Delhi
- Ongoing research project and using NeRFs (Neural Radiance Fields) developing custom volume rendering techniques to reconstruct 3D underwater scenes and view it in VR.

ICICDR - 2023, World Doctorates Day (View Certificate) **Lucknow, India**
Research Poster Presenter *Aug 2023*

- Youngest participant at the 11th International Conference on Issues and Challenges in Doctoral Research 2023
- Delivered a poster presentation titled "Navigating Empirical Challenges in Deep Learning Research". View it here

String Arts Pvt Ltd (Internship Certificate) **Remote, India**
Full Stack Web Development Intern *Jan - Mar 2023*

- Developed an official management web platform called "String Backend" using MERN Stack, incorporating features such as user authentication, email verification, notification, CRUD functionality, and a responsive user interface.
- This platform was designed for employee and content management, enabling the organization to manage projects, track completion status, and access employee details

Publications

[1] Arjan, A., Banerjee, K. (2023). Implicit neural representation in Roboyic exploration.
[Under Review]

- Supervisor: Assoc Prof. Kakoli Banerjee (Computer Science Department, JSSATE Noida)
- This survey focuses on exploring implicit mapping techniques for 3D real-world scenes in the field of robotics, specifically in the context of robotic exploration. Its primary goal is to offer researchers valuable insights into the most advanced and state-of-the-art INR (Implicit Navigation and Reconstruction) methods, which play a pivotal role in enhancing the efficiency and real-time capabilities of robotic SLAM (Simultaneous Localization and Mapping).

Ongoing Research Work

Machine Learning based SLAM for Autonomous Robotic Exploration

- Currently Technologies being used: ROS2, PyBullet, PyTorch, Python, C++, Gazebo, RViz, LiDar sensing, Computer Vision
- An optimized Machine Learning based SLAM system written from scratch, to develop State-of-the-Art autonomous navigation system for Robots.
- Potential Implementation - Quadrupeds, Warehouse Automation, self-driving vehicles, robotic exploration

Implicit Neural Representation techniques in Robotic Exploration

- Supervisor: Assoc Prof. Kakoli Banerjee (Computer Science Department, JSSATE Noida)
- A survey work on implicit mapping techniques for 3D real world scenes in robotics during robotic exploration
- It aims to provide researchers with insights on latest and state-of-the-art INR methods for efficient and real-time robotic SLAM (Simultaneous Localization and Mapping)

Personal Projects

Sea-Thru Implementation : Remove water from underwater images - Paper Link **Dec 2023**

- Technologies used: Scikit-learn, Scikit-image, SciPy, Depth-estimation: Huggingface Transformers
- A re-implementation of the novel approach, which utilizes our enhanced model to restore color from RGBD images. The Sea-thru technique gauges backscatter by analyzing dark pixels and their associated range data. Subsequently, it employs a calculated spatially varying illuminant to derive the range-dependent attenuation coefficient

NeRF: Neural Radiance Fields Implementation - Demo Video **Oct 2023**

- Technologies used: PyTorch, Google Colab's T4 GPU
- Generate a 3D neural representation of a scene using 2D input images. The model learns the scene features and perform novel view synthesis. Based on the original NeRF paper: Link

Hand gesture based Personal Assistant (Computer Vision) - GitHub Link **Aug 2023**

- Technologies used: Python, OpenCV, Mediapipe
- Perform actions like navigating through various files, increase/decrease volume & brightness on your PC, open Web Browser and visit websites - all using hand signs

Full Stack Django CRUD App - Portfolio Link

- Technologies used: Django(Python), Cloud DB - Postgress (Neon Tech)
- My portfolio page - created using Django. No hassle of CI/CD - remotely update the page contents using the Django's backend Admin Panel integrated with a remote Cloud Postgress Database provided by NeonTech.

Skills & Interests

Languages: Data Structures and Algorithms, C/C++, Python, JavaScript
Robotics: ROS2, Gazebo, RViz, SLAM, PyBullet
Version Control: Git, GitHub, Linux
Machine Learning/ Data Science: Python - NumPy, Pandas, Pytorch, Huggingface
Web Development: Django, MERN Stack
Research Interests: Deep Learning, Computer Vision, Implicit Neural Representation(INR), Scene Rendering techniques

Education

JSS Academy of Technical Education, AKTU **Noida, UP**
B.Tech (3rd Year), Computer Science & Engineering (Spec-AIML) - 7.7/10 CGPA (3.26 GPA Eq.) till 4th Sem *2021 - 2025*

Fr. Agnel School **Noida, UP**
CBSE Board (Class 10th & 12th) *2019 - 2021*

- **Class 12th:** 95.6% —**Class 10th:** 92.3%

Extra-curricular

Rockschool : Electric Guitar **Under Delhi School of Music**
Electric Guitar Examinations *2018-2019*

- **Grade 3:** 92% (Distinction) —**Grade 4:** 86% (Merit)

Fit in Deutsch (A1), Goethe Institute **New Delhi, 2018**