Amitabha Deb

Minneapolis, MN • deb00010@umn.edu • +17633989561 • LinkedIn • GitHub

Education

Master of Science, Robotics (Computer Science)
University of Minnesota, Twin Cities — Aug 2022 - May 2024
GPA: 3.95 / 4.00
Subjects: Machine Learning, Artificial Intelligence, Natural Language Processing, Intelligent Robotic Systems, Computer Vision, Deep Learning, Probabilistic Reasoning and Reinforcement Learning

Bachelor of Technology, Electronics and Communication
National Institute of Technology, Silchar — Aug 2015 - May 2019
GPA: 8.13 / 10.00
Subjects: Control Systems, Data Communication and Networks, Data Structures, Neural Networks and Fuzzy logic, Microprocessors

Skills

Programming Languages: Python, C, Java, SQL, R, MATLAB, HTML
Data Science Packages: Scikit-Learn, Pandas, Numpy, PyTorch, Tensorflow, Keras, NLTK, Flask, OpenCV
Software and Tools: ROS, Gazebo, Linux, Microsoft Office, Git, Jupyter Notebook
Soft Skills: Communication, Analytical, Problem Solving, Agile, English(Fluent)

Project Experience

Utility of Image Enhancement For Underwater Tasks: *GAN, YOLOv8, Siamese Network* — Spring 2024
- Underwater images and their corresponding generated enhanced versions are evaluated using detection and estimation models.
- The success of the models on both images is recorded, providing insights into the necessity of enhancement.

Comparison of Reinforcement Learning Algorithms: *Python, Dynamic Programming* — Spring 2024
- Compared the performance of Value Iteration, Policy Iteration and On-Policy First-Visit Monte Carlo Control Algorithm for Grid World MDP.

3D Semantic Reconstruction: *PyTorch, Scikit-Learn, UNet, COLMAP, kNN Classifier* — Fall 2023
- Performed a 2D segmentation with an IoU of 0.75 and generated 3D points from images.
- Constructed a pipeline from 2D semantic labels and 3D reconstructed points to estimate 3D semantic reconstruction.

Off-road Driveable Area Segmentation: *PyTorch, CycleGAN* — Fall 2023
- Trained the CycleGAN model on the "Yamaha-CMU-Off-Road" dataset to extend it.
- Employed the model for generating ground truth labels with a Dice score of 0.56.

Web App for FUnIE-GAN, Deep-SESR, SVAM: *Python, flask, HTML, and CSS* — Summer 2023
- Created flask-based API and deployed the web app on the IRV lab server.

Box Sorting using Baxter Robot: *Robot Operating System (ROS), OpenCV, Computer Vision* — Spring 2023
- Programmed Baxter robot to pick up color-coded boxes and place them on corresponding stacks.

Generalizability of FLAN-T5 Model Using Composite Task Prompting: *Hugging Face, LLM, NLP* — Spring 2023
- Designed compositions of tasks to experiment with the generalizability of the model.
- Recognized the limitations caused by the prompt structure and several keywords.

Mobile Robot Path Planning in Diverse Terrain Environments: *Python, A*, D*, RRT* — Fall 2022
- Evaluated the performance of search algorithms in a diverse 2d environment.

Work Experience

Software Engineer - *Java, SQL, Windows Server, React, Spring Boot* — Bengaluru, India
Lowe's — July 2019 – August 2020

- Handled the functionality of the Payment Switch enabling 19M transactions per week.
- Upgraded the encryption for store-to-payment switch data flow as a part of the End-to-end encryption project.
- Enhanced Receipt Retrieval and Chargeback Management System applications.

Teaching Assistant - *R, Statistics* — Minneapolis, USA
Carlson School of Management, University of Minnesota — Aug 2023 – Present

- Facilitating hands-on usage of R, grading assignments, and communicating with the students.

Publications

- Published *"Comparative Study of Machine Learning Algorithms on Sentiment Analysis of Product Reviews"* in 4th International Conference on Information and Communication Technology for Competitive Strategies (ICTCS 2019), December 13th-14th, 2019.
- Published *"An Ensemble Approach to Hostility Detection in Hindi Tweets"* in 7th IFIP International Conference on Computer, Communication and Signal Processing, (ICCCSP 2023) January 4 – 6, 2023.