ISHITA GUPTA

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EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Robotic Systems Development (MRSD) CGPA: 3.92 — August 2024 - May 2026

- Coursework: Generative AI (10-623), Robot Mobility, Manipulation, Estimation & Controls, Deep Learning (PhD), Systems Engineering, Robot Autonomy
- TA for Introduction to Deep Learning (11-785)

The LNM Institute of Information Technology (LNMIIT) — Jaipur, Rajasthan
Bachelor of Technology (B.Tech) in Computer Science and Engineering — August 2018 - July 2022

- Coursework: Probability & Statistics, Artificial Intelligence, NLP, GANs, Advanced Algorithms

EXPERIENCE

Addverb | Advanced Robotics & Industrial Automation | Website — Noida, India
Software Engineer – 2.5 years — January 2022 - July 2024

- **VSLAM**: Developed a complete Visual SLAM system for a quadruped robot, implementing **pose graph optimization**, bundle adjustment for **Local Mapping**, and Visibility Graph Visualizers using modern C++ and OpenCV. Designed the visual odometry pipeline with **feature extraction** using X-Feat descriptors, **Perspective-n-Point (PnP)** algorithms, and motion-only bundle adjustment, and optimized the back-end with a Levenberg-Marquardt-based graph optimizer.
- **Simulator Engineering**: Built a simulator engine using **OpenGL** and the **NVIDIA PhysX**, integrated with a Haptic device to deliver real-time force feedback, enhancing fidelity of robotic motion simulations.
- **Multi-Robot GUI & Rehabilitation Games**: Led the creation of a GUI application for **3** robotic systems – Robotic Arm (Cobot), Exoskeleton, and Haptic device, using **ImGui** (C++). Developed rehabilitation games **(Unity3D)** for Exoskeleton robots for physical therapy solutions.
- **Warehouse Management System**: Devised new APIs to enhance warehouse efficiency in WES and WMS using Java (**SpringBoot**), Kafka, MongoDB, **Design Patterns**, and **Multithreading** (threads, synchronization).

Google | Nest Devices Cloud — Bengaluru, India
Software Engineering Intern – 3 months — May 2021 - August 2021

- Automated a backend cloud pipeline, reducing a **4-month** task by 4-5 Google Software Engineers to a single Bash script. Curated an end-to-end onboarding infrastructure that generates and modifies **1,000+** lines of code across **150** files in multiple languages, driven by user configurations. Leveraged Python, JSON, Go, Bash, and Unit Testing.

PROJECTS

- **Humanoid Loco-Manipulation for Tote Logistics** | Link — August 2024 - Present
  Developing an autonomous humanoid robot system integrating hybrid whole-body control, motion planning, and sensor fusion (RGBD & LiDAR) for precise tote manipulation and obstacle avoidance in dynamic warehouse environments.
- **Training Language Models to Self-Correct via Reinforcement Learning** | Link August 2024 - December 2024
  Led benchmarking of self-correction in LLMs, evaluating performance across Llama 3.2 1B, Llama 3.1 8B, and Mathstral 7B on MATH dataset. Achieved accuracy rates of up to **41.8%**, identifying high Cor->Inc rates **(46.9%)** and low Inc->Cor improvement **(3.78%)**. Engineered a multi-turn reinforcement learning framework (SCoRe) for fine-tuning.
- **Automatic Speech Recognition using LSTM RNNs** — October 2024
  Created a phoneme recognition model with dynamic decoding (greedy and beam search), achieving a validation Levenshtein distance of **5** and validation loss of **0.31** for competitive phoneme sequence accuracy.
- **Face classification and verification Using CNNs** — September 2024
  Implemented and trained CNN models (ResNet34, SEResNet etc.) for face classification and verification using techniques like Transforms and CutMix achieving an **11%** Equal Error Rate and **90.6%** Validation accuracy.
- **Indian Classical Music Segmentation Using Machine Learning** | Link — January 2021 - January 2022
  Developed an onset detection technique to isolate the Percussion Solo section in concert audio, applying clustering algorithms (K-means, DBSCAN) and leveraging **Essentia** and **Librosa** for audio processing.

SKILLS

- **Programming**: C++, Python, Java, Go. | **Frameworks**: Pytorch, Scikit-learn, Angular, ROS2, Protobuf, Django.
- **IDE's**: VSCode, Pycharm, Cider. | **Others**: Linux, Gazebo, Mujoco, Github, Wandb, OpenCV, Matlab, Rviz, Unity 3D, NVIDIA PhysX, Kaggle.