

Daksh Adhar

+1(412)287-0335 | adhardaksh@gmail.com | linkedin.com/in/daksh-adhar | a-daksh.github.io

EDUCATION

Carnegie Mellon University - School of Computer Science

Pittsburgh, PA

Master of Science in Robotic Systems Development (MRSD) | GPA: 4.15/4

May 2026

Coursework: Deep RL, Learning for 3D Vision, Optimal Control and RL, Robot Autonomy, Robot Mobility, Computer Vision

Teaching Experience: TA for 16642-Manipulation Estimation and Control

Indian Institute of Technology, Guwahati

Guwahati, India

Bachelor of Technology in Engineering Physics | GPA: 8.27/10.00

May 2024

Coursework: Computational Physics, Simulation Techniques, Reinforcement Learning, Fundamentals of AI

SKILLS

Programming Languages: Python, C/C++, MATLAB, SQL, Julia

Tools/Frameworks: PyTorch, Tensorflow, MuJoCo, Isaac Gym, OpenAI Gym, ROS2, MoveIt2, Gazebo, PyBullet

EXPERIENCE

1X Technologies

Palo Alto, CA

AI Resident, Reinforcement Learning Team

May 2025 – August 2025

- Trained RL policies for dexterous manipulation on NEO hand, and added randomization for **sim-to-real** transfer
- Designed metrics to benchmark RL policies in both **Isaac Gym** and **MuJoCo**, evaluating **sim-to-sim** robustness
- Developed a **ROS 2 Humble** C++ controller to deploy evaluated policies in real-time simulation and teleoperation
- Built Tkinter-based local and Streamlit-based browser app for object segmentation mask data collection using **SAM2**
- Integrated Cloudflare R2 and DBEaver **SQL** backend to load frames and store operator clicks on 1M+ frames

Biomimetic Robotics & Artificial Intelligence Laboratory, IIT Guwahati

Guwahati, India

Research Assistant, Prof. Shyamanta M. Hazarika

January 2023 – May 2024

- Built a testing framework in **PyBullet** and **OpenAI Gym** to train RL policies for bionic hand power grasping
- Formulated reward functions and used **Soft Actor-Critic** algorithm to enable grasp-and-lift of deformable objects
- Applied **domain randomization** for sim-to-sim, achieving 38% slip reduction and 14% decrease in deformation

Invention Factory, IIT Gandhinagar

Gujarat, India

Summer Internship, Prof. Nithin V. George

May 2022 – July 2022

- Built a Raspberry Pi wearable device to improve spatial hearing performance for hearing-impaired individuals
- Utilized a **TDoA** Algorithm with a 4-microphone setup to achieve directional sound detection with 10° resolution
- Integrated haptic motors to convey sound direction as tactile feedback, reducing user response time

PROJECTS

AR assisted Robotic Total Knee Arthroplasty | [Website](#)

October 2024 – Present

- Developed a surgical robot for total knee arthroplasty, achieving 2 mm and 2° accuracy in drilling surgical pins
- Designed a planning subsystem that updates as surgical pins are drilled in the bone, using **MoveIt2** and **ROS2**
- Integrated a custom drill end-effector with **Arduino** serial communication, triggered by ROS trajectory commands
- Utilized **SAM** and **ICP** for real-time bone segmentation and registration, replacing invasive IR trackers

Unitree G1 Humanoid Soccer Ball Kicking | [Code](#) | [Report](#)

January 2025 – April 2025

- Simulated penalty-style ball kicking on the Unitree G1 humanoid with whole-body motion and balance control
- Computed strike impulse using quadratic programming and joint trajectories through **DIRCOL** optimization
- Stabilized the robot using **IHLQR** and tracked kicking motion with **TVLQR**, achieving <0.5 m error from targets

Pixel art using Franka Emika Panda Arm | [Code](#) | [Report](#)

January 2025 – April 2025

- Developed a pixel-art stamping system using Franka Emika Panda with custom end-effector for ink-pad stamping
- Optimized stamping order as a travelling salesman problem (**TSP**) using **Christofides** algorithm
- Implemented **position control** for pixel-to-pixel motion and **force control** for stamping to maintain pressure

PUBLICATIONS

Robustifying a RL agent-based bionic reflex controller through an adaptive sliding mode control

November 2023

Journal Paper at Cambridge University Press, Robotica

[Cambridge/Robotica](#)

Grasp force optimization as a Bilinear Matrix inequality problem: A Deep-learning approach

December 2023

6th National Conference on Multidisciplinary Design, Analysis and Optimization

[arXiv/2312.05034](#)

Reinforcement Learning-Based Bionic Reflex Control for Anthropomorphic Robotic Grasping

September 2023

Arxiv Paper

[arXiv/2312.05023](#)