

GAWTAM CHITHRA RAMESH

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Education

KTH Royal Institute of Technology

Master of Science in [Systems, Controls, and Robotics](#)

Aug. 2024 – Jul. 2026

Stockholm, Sweden

Indian Institute of Technology Madras

Dual Degree (B.Tech in [Engineering Design](#) and M.Tech in [Robotics](#))

Aug. 2019 – Jul. 2024

Chennai, India

Professional Experience

Masters Thesis

(Ongoing) Jan 2026 - Jun 2026

ABB Robotics, Mentors - [Matthew Lock](#) and [Jonathan Styrud](#)

Västerås, Sweden

- Exploring reinforcement learning and geometric generative modeling for safe, compositional translation from natural language to control policies under Signal Temporal Logic constraints for long horizon industrial manipulation.

Device Research Intern on 3D Scene Graph

Jul 2025 - Dec 2025

Ericsson Research, Mentor - [Puren Guler](#) and [Hector Caltenco](#)

Lund, Sweden

- Developed a robust 3DSG pipeline by integrating instance segmentation and tracking into a SOTA framework (Hydra)
- Designed a synchronized RGB-D inpainting pipeline to remove privacy-sensitive objects from 3DSG in realtime.
- Analyzed 3DSG frameworks identifying key research gaps in object merging, parameter sensitivity, and privacy protection
- Reduced sensitivity to parameter tuning, resulting in robust scene interpretation across diverse environments.
- Benchmarked SOTA inpainting algorithms to balance reconstruction fidelity with real-time performance.
- Lead author on research papers submitted to peer-reviewed venues, ICPR26(under-review) and IMPROVE26(accepted)

Graduate Robotics Intern on Modular Collaborative Robots

Dec 2022 - Jul 2023

Systemantics India Pvt. Ltd., Mentor - [Jagannath Raju](#)

Bangalore, India

- Developed backward-chained Behavior Trees for 6DOF manipulator to enable robust, long-horizon trajectory planning
- Designed and implemented a 6-DOF trajectory generation and control pipeline in C++, achieving real-time joint actuation via low-latency communication with motor controllers using D-Bus and SocketCAN.

Robotics Intern on Pallet Handling

June 2021 – July 2021

Yaskawa Pvt. Ltd, Mentor - Manju Tiwari

Gurgaon, India

- Modeled and analyzed 3D palletizing algorithm and mechanics for mixed carton sizes using MotoSim and teach pendant.
- Developed a C++ algorithm to effectively use robot's memory when sending data to the robot from computer.

Graduate Teaching Assistant

Aug 2023 – Nov 2023

Field and Service Robotics, Mentor - [Bijo Sebastian](#)

IIT Madras, India

- Involved in design and evaluation of assignments based on ROS and CoppeliaSim for 40 students.
- Held meetings with small groups of students with diverse backgrounds to review their assignments and projects.

Research Experience

Graduate Robotics Research on Deformable Object Manipulation

Jan 2025 - Nov 2025

[Robotics Perception and Learning](#), KTH, Advisor - [Florian T. Pokorny](#)

Stockholm, Sweden

- Integrated taxonomy-guided vision-language models (Gemini, Qwen) to interpret DOM scenes and map motion primitives
- Built prompt-taxonomy framework to generate structured, robot-parsable specifications from high-level prompts, demonstrating a pipeline for translating intuitive instructions into formal outputs.
- Performed quantitative analysis to identify failure modes and guide iterative improvements to the taxonomy and prompts
- Authored and submitted the results at ROMADO, an **IROS2025** workshop.

Dual Degree Project on Structure from Motion

Jan 2024 - May 2024

[INSPIRE Lab](#), Advisor - [Nirav Partel](#)

IIT Madras, India

- Developed a 3D perception system using COLMAP (Structure from Motion) from monocular RGB images to build cost-efficient human torso reconstruction for more accessible ultrasound.
- Implemented motion planning and control using ROS and MoveIt, and simulated the 5DOF manipulation in Gazebo.
- Integrated perception algorithms within ROS, processing 3D point clouds from RGB images to enable accurate trajectory planning for the ultrasound probe.

Scholastic Achievements

- Awarded (among 30 of 800+) the IIT Madras Young Research Fellowship based on remarkable research potential.
- Secured 97.64 Percentile in JEE Advanced & 99.10 Percentile in JEE Mains out of 1.5 Million across India.
- Secured an All India Rank of 52 out of 50k in Undergraduate Common Entrance Examination for Design.

Course Projects

Robot Learning and Embodied AI | DD2601 - KTH Sep 2025 - Oct 2025

- Implemented a 3D semantic object mapping pipeline using RGB-D data from ARKitScenes, integrating OwlV2 for open-vocabulary object detection, SAM for segmentation, and CLIP for semantic grounding.
- Implemented 2D-to-3D projection with depth fusion and camera geometry to construct dense, queryable semantic maps.
- Deployed a pre-trained Vision-Language-Action (VLA) model for robot manipulation, executing policy inference from visual inputs and natural language commands.
- Analyzed model behavior on unseen tasks to study generalization and robustness limits of current VLA architectures.

Multi Agent Path Finding in Unity3D | DD2348 - KTH Feb 2025 - May 2025

- Developed Hybrid A* path planner and waypoint tracking system in Unity3D for kinematically constrained single-agent (car/drone) navigation, achieving competitive performance.
- Engineered Conflict-Based Search (CBS) to solve MAPF for over 20 holonomic (drones) and non-holonomic (cars) agents, minimizing makespan in shared environments.
- Implemented a greedy dynamic goal assignment strategy for multi-agent teams ("bakery problem") integrated with CBS, optimizing task allocation and minimizing overall travel time.

Image analysis and Computer vision | DD2348 - KTH Oct 2024 - Nov 2024

- Applied Fourier Transforms for image filtering and frequency analysis; designed Gaussian smoothing filters via FFT to reduce noise and study effects on varying image resolutions.
- Implemented a multi-scale differential geometry edge detector and used Hough Transform for line detection from edges.
- Implemented image matching (SIFT, RANSAC) to estimate homographies (planar scenes) and fundamental matrices, enabling 3D scene reconstruction via triangulation

Introduction to robotics | DD2348 - KTH Sep 2024 - Oct 2024

- Implemented an iterative inverse kinematics solver from scratch for a 7-DOF KUKA robot arm in ROS
- Applied RRT* to find collision-free paths for a Dubins car, showcasing path planning for non-holonomic vehicles.
- Integrated a Behavior Tree mission planner for a TIAGo mobile manipulator (using ROS and Gazebo), enabling autonomous navigation, vision-based grasping, and robust task execution (e.g., kidnapped robot recovery).

Projects

Virtual Reality with Reinforcement Learning shooter Game | CFI, IIT Madras May 2020 - Aug 2020

- Worked on Multi-Agent and Cooperative play using Reinforcement Learning (PPO), simulating a Shooter Strategy Game
- Simulated the agent in Unity3D environment with obstacles & mazes exploring different strategies

Python API for Fusion360 | Prof. Ramanathan Jan 2020 - Feb 2020

- Developed a Python script using Fusion 360 API to automate the process of duplicating a 3D model with different dimensions imported from a .csv file

Technical Skills

- **Languages** : Python, C, C++, C#
- **DL** : Pytorch, OpenCV, wandb, JAX
- **Robotics** : ROS2, Unity3D, MATLAB, MuJoCo
- **Tools** : VS Code, Docker, Git, L^AT_EX, CUDA, Slurm

Position of Responsibilities

Student Buddy | THS International Winter Reception 2025, KTH Jan 2025 – Feb 2025

- Co-organized multiple fun games and events to welcome international students at KTH.
- Acted as the primary point of contact for 20 international students part of the buddy group.

Head of Industrial and Public Relations | Dept. of Engineering Design, IIT Madras Apr 2021 – May 2022

- Headed and mentored a three-tier team overseeing placement and internship processes for over 1,200 students
- Actively involved in Alumni and Company Outreach to further improve the opportunities available for students
- Planning & executing the logistic framework for the first ever shift to hybrid mode of the recruitment process

Strategist | Computer Vision and Intelligence Group, IIT Madras Apr 2020 – May 2021

- Responsible for the Budgeting, Managing and Organizing of all CVIG Sessions, GitHub, Instagram, Blog & Discord
- Co-Mentored student projects involving Image Analysis & Reinforcement learning for games
- Co-Organized a Deep Learning Summer School for over 500 students on topics from DL, RL, and CV