# Karteek Gandiboyina

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## Education

**University of Illinois Urbana-Champaign** | MS in Autonomy & Robotics | GPA: 3.89/4.0     Aug 2024 – Dec 2025
- **Coursework:** Deep Learning for Graphs, Computer Vision, Safe Autonomy, Human-Centered Autonomy

**Indian Institute of Technology Kharagpur** | B.Tech in Electrical Engineering | GPA: 3.48/4.0     Aug 2017 – May 2021
- **Coursework:** Deep Learning, Machine Learning, Embedded Systems, Power Electronics, Control Systems

## Experience

**R&D Robotics Engineer** | Konica Minolta – Tokyo, Japan     July 2021 – Aug 2024
- Specialized in industrial bin picking task for items of high surface reflectance at low light conditions under 10 Lux.
- Developed a point cloud sensing device, capable of predicting 1cm×1cm items at a 0.05m range with 0.99 IoU accuracy.
- Built an auto-annotation tool to speed up the training process of object detection AI models, Detectron2, Yolo-V7.
- Filled 2 patents in computer vision and Robotic grasping at USPTO and JPO.

**Machine Learning Intern** | Philips Innovation Campus – Bangalore, India     April 2020 – July 2020
- Worked on 888 CT's from Luna 16 dataset. 3D region proposal U-Net with residual learning for pulmonary nodule detection
- ResNet for residual learning and U-Net for small object detection. Overall, achieved a FROC score of 0.914.

## Projects

**PORTRS : PAYLOAD ORGANIZATION AND TRANSPORTATION ROBOTIC SYSTEM**     JAXA
- Collaborated with JAXA Japan Aerospace Exploration Agency, created a novel solution for visually assist multi-limbed robot.
- Designed and optimized an AI model for grasping and manipulating various objects inside International Space Station.

**Multitask Learning with Language using AIRL** | Georgia Tech & Konica Minolta     gail_airl_pytorch.git
- Achieved a remarkable 72% accuracy milestone, demonstrating up to a 200% enhancement in zero-shot task success rates and accelerated skill transfer to novel tasks, showcasing the power of language-based goal specification in robotics.
- Tools Used: Pytorch, Metaworld, Mujoco-py, Imitation Learning, Behaviour Cloning

**Autonomous Drone Racing** | UIUC     DroneRacer-MPC-Vision.git
- A MPC & PID tracker is implemented to facilitate the spline tracking. a racing record of 50.126 seconds for final tier 1.
- Utilized NanoSam with a keypoint detector to identify misaligned gates, achieving a positional prediction error of 0.05m.
- Tools used: Python, Airsim, MPC, PID, Spline generator, Trajectory planning, State-Space estimation

**VLM4Autonomy** | UIUC     VLM4Autonomy-.git
- Obtained efficient object tracking and estimation of ego-vehicle motion by combining SAM2 and optical flow with VLM.
- Tools used: Python, VLM, LLM, SAM2, YOLO-V8, Structure-from-motion, Visual Odometry, SpatialBot

## Patents | Publications

**Component Posture Information Acquiring Device And Posture Determination Method**     JPO: 20240338849

**Performance Prediction for Chip Design with HLS and Graph Contrastive Pre-training**     Paper Link
- Developed a novel approach for the prediction of the performance of the HLS chip design using graph contrastive learning and LLM-based feature extraction, achieving a 37. 4% improvement over the baseline methods.

**Robocup symposium 2020** | SSL Robocup     Paper Link
- "KgpKubs 2020 Team Description Paper", includes software and hardware developments made by krssg from 2019 to 2020

## Skills

C++, Python, Verilog, Pytorch, Keras, Tensorflow ROS, Github, Docker, Airsim, Linux, Anaconda, GYM AI, Solidworks

## Competitions

**Robocup SSL 2019** | SSL Robocup | Sydney, AUS     June 2019
- Qualified for RoboCup Soccer Small-Scale League 2019, made 8 fully functioning SSl robots for the competition.