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, Deep Generative Models

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.
- 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.
- Collaborated with Georgia Tech to develop a multitask learning framework for cobots using Adversarial Inverse Reinforcement Learning (AIRL); achieved 72% accuracy and up to 200% improvement in zero-shot task success, enabling faster skill transfer through language-based goal specification.
- Filed 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 | Contributions

Principles of Safe Autonomy Course Assistant | UIUC ECE-484

- Assisted students with the AirWays project by evaluating submissions, setting up metrics, and providing technical guidance.

Volatility-Aware Stock Prediction via Transformer-VAE-Flow | UIUC VAE-Stock-Predictor.git

- Built a Transformer-VAE with RealNVP flows to generate VIX-conditioned stock data, achieving 0.0629 Wasserstein Distance.
- Tools used: Python, Pytorch, Deep Generative Models, Transformers, VAE, RealNVP, yfinance, Latent Variable Models.

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, NerF, 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

- Achieved a 37.4% performance improvement in HLS chip design prediction using graph contrastive learning and LLM.

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

Programming | Machine Learning: C++, Python, PyTorch, OpenCV, Github, Docker, Linux, Generative Models, GNN, LLMs.
Robotics | Simulation: ROS, Airsim, NerF, GYM AI, Mujoco, MetaWorld, SLAM.

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.