

Srikanth Elkoori Ghantala Karnam

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Experience

Research Assistant Intern, Vistruaz LLC – Remote, USA Aug 2024 – Present

- Leveraged Natural Language Processing (NLP) techniques to develop a Docker container capable of extracting relevant data from unstructured text documents utilizing SpaCy and NLTK, achieving parsing accuracy over 90%.
- Developed the underlying math involved in the AI library for handling complex number backpropagation, translating research concepts into practical models and algorithms, with source control systems using Git and GitLab.

Machine Learning Intern, Quanterra Software, CattleQuants – Cleveland, OH, USA May 2023 – Sep 2023

- Spearheaded the end-to-end design, training, testing, evaluation, and deployment of semantic segmentation based classification model to identify invasive plant species on water bodies, achieving a remarkable 99% precision, and recall.
- Engineered a TensorFlow based U-NET model with memory efficient data generator equipped with a robust data augmentation and feature engineering pipeline in python, resulting in a 10% decrease in model training time.

Reinforcement Learning Research Assistant, RISC Lab, UC – Cincinnati, OH, USA Dec 2022 – May 2023

- Developed Deep Reinforcement Learning algorithms for unmanned robotic decision making, motion planning, and control.
- Formulated Multi-Agent DDPG algorithms to achieve synchronized convergence of multiple unmanned aerial vehicle with ranging sensors within the AirSim simulator, achieving 95% success rate in presence of noisy sensor data.

Software Engineer, Accenture – Hyderabad, TG, India Aug 2018 – Jan 2021

- Spearheaded the development and maintenance of C++ based EDI middleware architecture by performing debugging and root cause analysis for seamless software integration, achieving over 20% operational efficiency improvement.
- Collaborated with multi-disciplinary teams and customers to implement CI/CD pipelines with extensive technical design documents, system testing, data collection and analysis, leading to successful delivery of over 10 projects annually.

Projects

Traffic Detection and Tracking using YOLO [GitHub/S-EGK/Traffic-Detection-Tracking-System](https://github.com/S-EGK/Traffic-Detection-Tracking-System)

- Integrated a YOLO based object detection model with a specialized tracking algorithm using PyTorch and OpenCV in Python.
- Trained the model on a custom dataset created from over 500 images captured from diverse traffic conditions for real-time detection and tracking of vehicles, achieving a tracking error of 20-25% compared to DeepSORT neural net benchmark.

Face Detection System with OpenCV and Deep Learning [GitHub/S-EGK/Computer-Vision](https://github.com/S-EGK/Computer-Vision)

- Developed a Python-based face detection system using OpenCV's DNN module, achieving 95% accuracy in detecting faces across various lighting conditions, with CUDA acceleration improving processing speed by 30%.
- Implemented real-time face detection using ResNet models, processing both still frames and complete video files efficiently.

EKF-SLAM with UWB Sensor on ROSbot 2 PRO mobile robot

- Implemented onboard EKF-SLAM algorithm in ROS for precise localization and mapping of ROSbot 2 PRO mobile robot equipped with UWB sensors, IMU, and wheel encoders, resulting in 20% reduction of pose uncertainty.
- Enhanced the mapping of UWB sensor-based landmarks by fine-tuning the Extended Kalman Filter and sensor parameters.

RTAB-Map based Simultaneous Localization and Mapping (SLAM) [GitHub/S-EGK/Map-My-World](https://github.com/S-EGK/Map-My-World)

- Implemented RTAB-Map SLAM using gmapping ROS package using to generate accurate 2D occupancy grids and 3D point clouds of an unknown environment using RGBD Camera and LIDAR sensors, with less than 0.3m map generation error.
- Developed a robot simulation in Gazebo to test and validate the SLAM process with real-time visualization in RViz.

Skills

Programming/Scripting: Python, C++, MATLAB, SQL, ROS, ROS2, Bash, cmd, PowerShell

Libraries and Frameworks: TensorFlow, Keras, PyTorch, Scikit-Learn, OpenCV, CUDA, NumPy, SciPy, Pandas, Matplotlib

Tools: Gazebo, Rviz, AirSim, Carla, Git, Docker, Linux, SolidWorks, Ansys

Certificates: [Udacity Nanodegree – Robotics Software Engineer](#)

Education

University of Cincinnati, MS in Mechanical Engineering (Robotics) – Cincinnati, OH, USA Apr 2024

- **Thesis:** Deep Reinforcement Learning Based Search and Capture with Erroneous Information
 - Implemented the Double Deep Q-Network model with optimized reward function using TensorFlow to train an autonomous UAV to search and capture a ground intruder in a grid with the aid of Unattended Ground Sensors with local and erroneous intruder information, achieving 97% success rate.

Osmania University, BE in Mechanical Engineering – Hyderabad, TG, India Jun 2018

Publications

- **Q-Learning Based Search of a Ground Target in a grid with partial information** | Srikanth Elkoori Ghantala Karnam and Rajnikant Sharma | AIAA 2023-2654 | AIAA SCITECH 2023 Forum | January 2023 [doi/10.2514/6.2023-2654](https://doi.org/10.2514/6.2023-2654)