Jinesh Rajasekhar

(+1) 508-762-6133 jineshrajasekhar@gmail.com linkedin.com/in/jineshr jineshrs2398 Portfolio

EXPERIENCE

Computer Vision Engineer Jul 2024 - Present
Tatum Robotics *Boston, MA*
- Collaborated with a multidisciplinary team to design an innovative robotic hand for deaf-blind individuals, leveraging American Sign Language to improve communication for over 2 million sensory-disabled users
- Achieved 90% real-time gesture recognition accuracy by integrating MediaPipe and Transformer-based models

Robotics Programmer - Computer Vision Jun 2024 - Jul 2024
The Vibrant Health Association *Atlanta, GA*
- Developed a multi-threaded YOLOv5-based human detection system with 94% recognition accuracy, ensuring reliable event automation using PyTorch, ensuring reliable user engagement during choreographed event

Research Assistant - Perception Jan 2023 - May 2023
Vision, Intelligence and Systems Lab *Worcester, MA*
- Reduced RMSE by 0.6% on KITTI test set by introducing a Transformer-based camera and LiDAR fusion approach into PENet depth completion models

Software Engineer - Robotics May 2022 - Jul 2022
Healthcare Technology Innovation Center *Chennai, India*
- Developed a PyQT-based Graphical User Interface (GUI) for a 6-DOF image-guided surgical robot, streamlining clinical trial workflows for medical professionals
- Simulated real-time robot interactions in PyBullet and optimized system communication using XML-RPC

Embedded Systems Research Engineer May 2019 - Jul 2019
Kriya NeuroTechnologies *Chennai, India*
- Designed and prototyped a wearable device using CAD and 3D printing to monitor gait in older adults, integrating ATSAMD21 microcontroller and MPU-9250 IMU sensors
- Enhanced real-time data accuracy by implementing noise reduction techniques in IMU signal processing

PROJECTS

3D Scene Reconstruction and Camera Localization – Developing SfM pipeline to reconstruct 3D scene and compute camera poses using triangulation, PnP and Bundle Adjustment [GitHub]

Panorama Image Stitching – Engineered an image stitching system with ANMS, homography estimation, feature matching, and RANSAC-based outlier rejection [GitHub]

Vision-Controlled Bionic Arm – Created a real-time gesture-controlled bionic arm using Python and MediaPipe, enabling seamless human-to-robot synchronization [GitHub] [Video]

Image-based 3D Object Reconstruction using NeRF – Transformed 2D images into photorealistic 3D models using TensorFlow-based NeRF techniques [GitHub]

Visual Odometery for Monocular Camera – Delivered 94% pose estimation accuracy on the KITTI dataset with ORB feature detection and FLANN-based matching [GitHub]

Auto-Calibration for Camera – Implemented Zhang's calibration method for optimized intrinsic and extrinsic parameters via nonlinear optimization [GitHub]

Image Classification of Stroke Blood Clot Origin – Achieved 72.4% accuracy and F1 score of 0.701 for pathology image classification using DenseNet-based transfer learning [GitHub] [Website]

HuRoS: Humanoid Robotic System – Built a 10-DOF bipedal robot using MATLAB for inverse kinematics and 3D printing for custom components, enabling stable traversal of flat surfaces [GitHub]

SPEAR: Soft Robotic EMG Assisted Rehabilitation – Designed a bio-inspired device for stroke rehabilitation using EMG signals to control pneumatic air muscles for foot movement [GitHub] [Video] [Publication]

SKILLS

Programming Languages: Python, C/C++, Embedded C, MATLAB
Frameworks: PyTorch, TensorFlow, OpenCV, MediaPipe, ROS
Embedded Systems: ATSAMD21, Arduino
Tools: PyQT, Git, Solidworks, Simulink, Creo, CARLA

EDUCATION

Master of Science in Robotics Engineering Aug 2022 - Aug 2024
Worcester Polytechnic Institute, Massachusetts

Bachelor of Technology in Electrical and Electronics Engineering Jul 2017 - May 2021
National Institute of Technology Tiruchirappalli, India