

SASANK POTLURI

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EDUCATION

Master of Science in Robotics and automation

Jan 2022 – May 2024

Northeastern Khoury college of Computer Science

3.81/4 GPA

Relevant Courses: Computer Vision, Factor Graphs, Sensor Fusion, Deep Learning, Reinforcement Learning, Control Systems

Bachelor of Technology in Mechanical Engineering

Jul 2016 – Jun 2020

Manipal Institute of Technology

8.29/10 GPA

Relevant Courses: Manufacturing Technology, Computer Aided Drawing, Machine Design, Nonlinear Optimization

EXPERIENCE

Autonomy Systems Intern | C++, Python, PyTorch, Azure, CANalyzer

Jan 2023 – Aug 2023

Danfoss Autonomy

Minneapolis, Minnesota

- Adapted LIO-SAM for a 6-axis IMU using additional GPS and conducted system testing to identify off-road failure modes
- Leveraged ROS to test third party SLAM algorithms and LIO-SAM on robot hardware for company specific use cases
- Conducted System Testing along with FMEAs on third party SLAM algorithms and LIO-SAM for company specific use cases
- Developed C++ code to provide ethernet communication between a SLAM controller and Danfoss controller
- Implemented an additional decoder on unimatch network to parallelly compute Optic Flow, Stereo Disparity, and 3D detection
- Achieved a 9.87 AP3D on Object detection task without fine-tuning the encoder of the unimatch network
- Performed 3D-object detection using YOLO-v8 and DBSCAN on the colored pointcloud generated from LiDAR camera fusion
- Leveraged synthetic data from Nvidia-IsaacSim to train YOLO-v8, achieved 0.45 mAP for real-world forklift detection
- Fused a 16-ch 2D LiDAR with camera data using a depth completion network, resulting in an MAE of 0.178 meters

Research Assistant at Hydrodynamics Lab | Ansys, SolidWorks, Fusion360, Matlab

Jan 2020 – Jun 2020

Manipal Institute of Technology

Manipal, Karnataka

- Added additional Pressure sensor to existing test-rig and acquired dynamic pressure and position readings using Matlab
- Used the Data acquisition system to acquire the dynamics and stability of a water-lubricated hydrodynamic bearing
- Created a 3D dynamic CFD model in Ansys and used the data to tune simulation parameters
- Revamped the model to boost dynamic bearing stability, but achieved performance similar to the original design

PROJECTS

Bundle adjustment on Buddha images | Python, GTSAM, OpenCV

Nov 2023

- Implemented SFM pipeline for sparse 3D reconstruction from images, used SIFT to extract, match and triangulate 3D keypoints
- Solved Bundle Adjustment using GTSAM to get accurate and optimized keypoints with camera poses

3D object tracking using Multi-view Images | Python, PyTorch, NumPY

Nov 2023

- Achieved an Object tracking accuracy of 15.1% by implementing an Extended Kalman Filter on 3D object-detections
- Implemented PETR-v1 tracking decoder, achieving 20.8% accuracy, and conducted comparative analysis of both approaches

Feature detection and Image mosaic | Linux, Python, GTSAM

Sep 2023

- Used the Caltech camera calibration toolbox to compute extrinsic and intrinsic parameters and undistort the images
- Applied Superglue and other classical feature detectors to compute image matches in an underwater archaeological site
- Created a mosaic using the matches and optimized the pose graph to obtain better mosaic of the site

Reinforcement Learning on Robotic Arm | Python, PyTorch

Nov 2022

- Iterated through various continuous control algorithms to train a robotic arm for pick-and-place and reach a point operations
- Re-engineered the reward function to penalize the number of moves improving speed and stability of Robotic Arm

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Control system design of Segway | Matlab, Simulink

May 2022

- Used stability analysis, and root locus design to pick optimum proportional, integral, and derivative values to control a segway
- Further solved the problem by using state space methods and improved segway performance by adding additional compensator

Performance comparison among SLAM algorithms | ROS, C++, ORB-SLAM3, LeGO-LOAM, Matlab

Apr 2022

- Collected camera, LiDAR, IMU and GPS data of test vehicle driving in urban environment by writing ROS publisher node in c++
- Utilized the collected data to test LeGO-LOAM and ORB-SLAM3 and compared their results and failure cases

Structural design for FSAE racecar(Formula Manipal) | Ansys, CATIA, SolidWorks, Fusion360

Oct 2017 – Feb 2019

- Lead the composite subsystem of the team to efficiently design and manufacture Composite automotive parts
- 3D-printed, added composite reinforcement to Intake Manifold, achieving 50%+ weight reduction compared to prior versions
- Designed and manufactured Carbon-fiber seat, and aero-package and won second place for design in Formula Bharat 2019

TECHNICAL SKILLS

Languages: Python, Java, C, HTML/CSS, JavaScript, SQL

Developer Tools: VS Code, Eclipse, Google Cloud Platform, Android Studio

Technologies/Frameworks: Linux, Jenkins, GitHub, JUnit, WordPress

ACHIEVEMENTS / EXTRACURRICULAR

- Appeared for GATE 2021 and secured an All-India Rank of 523 out of 120594 (99.566 percentile)
- Secured 3rd place in FSAE Bharat 2019 and 2nd place in the design event of the competition
- Engineered carbon fiber components for FSAE race car, such as intake manifold, sidepods, and seat, achieving a minimum 13% weight reduction compared to previous versions
- Engineered carbon fiber components for FSAE race car achieving a minimum weight reduction of 13% on all parts