ADHEESH CHATTERJEE

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EXPERIENCE

3D Computer Vision Engineer, VanGogh Imaging Inc, *Nov 2021 - Present*

- Successfully handled the migration of the indoor scene reconstruction codebase working with android sensors - Structured light/TOF sensor to iOS while ensuring seamless integration and functionality to work with iOS sensors - RGB Camera, LiDAR and IMU.
- Collaborated with a senior engineer to provide IMU integration to the existing SLAM algorithm to improve stability and feature tracking capability.
- Spearheaded the development of demo products for customers by constantly updating and enhancing exisiting features on Unity to handle different platforms and library integration.
- Ensured seamless integration of 3D Face Reconstruction algorithm to iOS using sensors - RGB Camera, TrueDepth sensor and IMU.
- Collaborated with multiple clients in Medical and Tele Robotics space to provide innovative computer vision solutions, customizing our existing SLAM to meet their unique requirements.
- Facilitate seamless communication & sensor data exchange between diverse client hardware devices & our proprietary algorithms, resulting in optimal performance and client satisfaction.
- Developed new features for our exisiting demo applications that provide flat surface/wall detection as well as object detection from 3D point clouds without RGB data for specialized use-cases.
- Proficiently utilized C++, C, C#, Swift, and Python programming languages on a daily basis, as well as version control tools such as JIRA and Git to ensure optimal performance and timely delivery of projects.

Sr. Computer Vision Engineer, Vidalign Inc. (characterfacegen.com) *Aug 2020 - Nov 2021*

- Developed a precise facial landmark detection and tracking module used for 3D mesh generation.
- Designed various features like facial segmentation and landmark redundant systems to improve the 3D mesh solution.
- Developed a parametric model for facial wrinkles & generated tension maps to match customer needs.
- Deployed a texture acquire algorithm to extract albedo and lighting at an industry standard to be baked onto the mesh.
- Aided in development of a lip-syncing feature for our product by modifying our final 3D mesh to seemlessly pick up lip movement and facial expressions to from an existing mesh/image to meet client needs.
- Co-Led a small team of engineers in deploying SLAM & vision pipelines for 3D reconstruction with LiDARs and cameras.
- Primarily used Docker and Git to set up deployment of prototypes, maintain communication and ensure version control.

PROJECTS

Computer Vision Projects

- Developed various computer vision techniques, including Visual Odometry, Lane Detection, Traffic Sign Recognition and Classification, Lucas Kanade Object Tracker, Color segmentation using Gaussian Mixture Models
- Leveraged the Structure from Motion (SfM) approach to reconstruct a high-fidelity 3D point cloud, employing advanced techniques such as RANSAC-based outlier rejection, PnP estimation, & Bundle Adjustment for optimal accuracy.
- Developed and implemented the FastSLAM algorithm to accurately track dead reckoning and estimate robot paths based on obstacle detection in dynamic environments.
- Designed and developed an encoder-decoder CNN architecture for semantic segmentation and depth estimation of RGB-D images, with a focus on Cityscapes and Kitti datasets.
- Created an object detection system using RCNN, implementing selective search & region proposal techniques, & extending it to support multi-class object detection. Demonstrated image classification capability on the ImageNet dataset.

Sensor Fusion Projects

- Processed Lidar Point Cloud, Radar, and Camera data to calculate total time to collision from preceding vehicles and 3D object tracking in C++ using Point Cloud Library
- Developed a ROS interface for localization on the motion capture workspace using raw sensor data (IMU, Camera, Magnetic Encoders) for tracking a non-holonomic differential drive robot using a Raspberry Pi and an Arduino Nano. Deployed the RTAB-Map ROS package on the mobile robot to generate a high-fidelity 3D map,

EDUCATION

Masters of Engineering, Robotics *Aug 2018 - May 2020*
University of Maryland GPA: 3.63

Bachelor of Technology, Mechanical Engineering w/ Minors in Computer Science *Aug 2014 - May 2018*
Vellore Institute of Technology GPA: 3.6

SKILLS

Patents : Generating 3D Facial Models & Animations using Computer Vision Architectures (Provisional - June 30 2022)
Programming: Python, C, C++, C#, Swift, ROS, Matlab, OpenCV, OpenGL, Pytorch, Tensorflow, CMake, Unity
Interests: SLAM, Object Detection and Tracking, 3D Reconstruction, 3D Mapping, Sensor Fusion, Optimization
Certifications: Udacity Robot Software Engineer, Coursera Deep Learning Specialization