Anvesh Reddy Gummi

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EDUCATION

Carnegie Mellon University Pittsburgh, PA
Master of Science in Mechanical Engineering - Robotics Specialization, GPA: 4.0/4.0 *Dec 2023*
- Relevant Coursework: Computer Vision, Visual Learning Recognition, SLAM, ML/AI, Modern Control Theory.

BMS College Of Engineering Bangalore, India
Bachelor of Engineering in Mechanical Engineering, GPA: 8.84/10 *May 2019*
- Relevant Coursework: Fundamentals of Robotics, Advanced Robotics, Controls, Mechatronics, Machine Learning.

WORK EXPERIENCE

Biorobotics Lab - Robotics Institute, Carnegie Mellon University Pittsburgh, PA
Researcher - Advised by Prof. Howie Choset *Sep 2022 - Dec 2022*
- Worked on collecting in transmitting Realsense - RGBD's, array of 8 Thermal cameras', and three RGB cameras' data between the robot and base station separated by 30-60ft all at real time. Used OpenCV and ROS2.
- Initiated work on providing autonomous control based on vision.

Dassault Systemes Solutions Lab Bangalore, India
R&D Software Developer (C++) - Assembly Simulation Team (DELMIA) *July 2019 – July 2022*
- Developed and maintained Manufacturing Assembly Simulation solutions - Product Life-cycle Management.
- Implemented software features end-to-end: Planning, Development, Testing, Documentation, and Maintenance.
- Collaborated with various international cross-cultural teams for multiple application features. Provided product support for many notable customers like Mercedes Benz, Honda, etc.

PROJECTS

Using Diffusion Model to showcase AI-generated apparel designs on human models Mar. 2023 – Present
- Using a pipeline of Segmentation, basic image processing, stable-diffusion (Latent space diffusion), and person image synthesis (PIDM), generated high-res images of artificially created new clothing designs on human models with multiple poses. The generation was controlled by input human model, desired texture, text prompt, and poses.

Visual Learning and Recognition Jan. 2023 – Present
- Implemented FCOS Object Detection:21.7% mAP on Pascal VOC; Trained GAN models on CUB2011 (FIDS: Vanilla GAN:61.2, LSGAN:65.5, W-GAN:72.5); trained AE and VAE (with β annealing) on CIFAR10; Performed an inference on Diffusion Models (FIDs- DDPM:31.8, DDIM:34.9); Trained Transformers to caption images on COCO captions dataset(0.03 training loss); ViT on CIFAR10 (test acc:68%, train acc:100%, training loss:0.25)

Classical Computer Vision Projects Sept. 2022 – Dec. 2022
- Implemented Hough Transform for Edge Detection, Bag of Visual Words for Scene Classification(60% acc on SUN image Dataset compared to VGG16 97.5%), Homography Estimation (features: Harris corners, BRIEF descriptor matching) for Augmented Reality and Stitching Images, 3D Reconstruction, LK Image Alignment, and Tracking.

Lung cancer detection using Computer Vision June. 2018 – May. 2019
- Trained a custom model to classify malignant cancer cells in Lung CT Scan images using Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), appended Mask-RCNN for locating malignant nodules.

ML models to Correlate Global Climate Change with Pittsburgh's Climate Sept. 2022 – Dec. 2022
- Performed Time Series analysis with global-scale greenhouse gases and world temperatures to forecast Pittsburgh weather, using Artificial Neural Networks, Support Vector Regression, and Random Forest to compare results.

Super Visual-Lidar Odometry and Mapping Mar. 2023 – Present
- For visual odometry in VLOAM, used Superpoint and Superglue deep learning models for feature extraction/matching. Compared with ORB-SLAM2, VLOAM. Requires more fine-tuning to justify GPU costs.

Simultaneous Localization and Mapping (SLAM) Jan. 2023 – Present
- Implemented various filtering algorithms: Bayesian Filter, Kalman Filter, Extended Kalman Filter, Unscented Kalman Filter, and Particle Filter for Localization. Used sparse-matrix methods for linear and non-linear 2D SLAM Least Square. ICP + Point-Based Fusion on RGBD data for building 3D point cloud and pose estimation.

Additional Coursework

Certifications: Deep Learning Specialization (5 courses) - Deeplearning.ai, Coursera
Programming Languages: C++, Python, MATLAB, C, JavaScript, Bash scripting.
Application Software: ROS, ROS2, Gazebo, Solidworks, Ansys, 3DEXPERIENCE - CATIA, DELMIA (multiple apps)
Tools/Libraries: PyTorch, Keras, OpenCV, SQL, MS Office, LaTeX, GitHub, HTML, CSS.

AWARDS

Evangelist Award | *Dassault Systemes* Jun. 2020
Best Project In Mechanical Engineering Dept | *BMS College Of Engineering* May. 2019