ADITYA WAGH

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Final year ECE graduate student well-versed in Multi-view geometry, 3D reconstruction, Visual-Inertial Odometry, SLAM, Visual Localization, Sensor Fusion, Bundle Adjustment, LiDAR point-cloud processing.

EDUCATION

- **New York University** — **New York City, NY**
  MS in Electrical and Computer Engineering; GPA: 3.72/4 — *Sep 2021 – May 2023*
  Coursework: Robot Perception, Robot Localisation, Deep Learning, High Performance ML, Foundations of Robotics, Probabilility & Stochastic Processes, Digital Signal Processing
- **Birla Institute of Technology and Science (BITS), Pilani** — **Pilani, India**
  B.Eng in Electronics Engineering — *Aug 2015 – May 2019*

EXPERIENCE

- **AI4CE Lab at New York University** — **New York City, NY**
  Graduate Research Asistant — *Sep 2022 – Present*
  - Developing new techniques to improve pair-wise LiDAR point cloud registration with low overlap; Currently experimenting with outlier rejection techniques to find the low overlapping region.
  - Teaching Assistant for ROB-GY 6203 Robot Perception – a graduate level course about 3D Computer Vision.
- **Central Electronics Engineering Research Institute** — **Pilani, India**
  Deep Learning Intern — *Jul 2018 – Dec 2018*
  - Contributed to the development of a software pipeline for pixel wise annotation of a novel data set consisting of 6000+ Infrared and RGB aerial images of power cables
  - Fine-tuned a Mask-RCNN model for instance segmentation of power cables on this new dataset and achieved a test accuracy of approximately 70%

PROJECTS

- **Fast 3D Object Detection in the Wild** — MATLAB ·
  - Computed SIFT features for each image in database and queries using OpenCV's built-in SIFT feature extractor
  - Employed the k-means clustering algorithm to compute 800 cluster centroids to be used as visual words to generate a histogram of visual words in each image
  - Computed histograms of visual words for all the query images and database images and extracted similar images from the database by using the k-nearest neighbours algorithm on the generated histograms
- **Post-Earthquake Damage Assessment using Fully Convolutional Networks** — Tensorflow, Keras ·
  - Designed fully convolutional network for multiple semantic segmentation of building components and their damage state using a shared backbone
  - Implemented batch normalization layers to enable faster convergence and better generalization over real data since the data used for the project was synthetically generated using physics based graphical models
  - Achieved a mAP of 83% over 5 component classes and mAP of 70% for 5 damage state classes
- **Visual Place Recognition using Bag of Visual Words** — OpenCV, Sklearn ·
  - Computed SIFT features for each image in database and queries using OpenCV's built-in SIFT feature extractor
  - Employed the k-means clustering algorithm to compute 800 cluster centroids to be used as visual words to generate a histogram of visual words in each image
  - Computed histograms of visual words for all the query images and database images and extracted similar images from the database by using the k-nearest neighbours algorithm on the generated histograms
- **Deep Image Matching using Local Feature Trasformers** — OpenCV ·
  - Computed SIFT features for each image in database and queries using OpenCV's built-in SIFT feature extractor
  - Employed the k-means clustering algorithm to compute 800 cluster centroids to be used as visual words to generate a histogram of visual words in each image
  - Computed histograms of visual words for all the query images and database images and extracted similar images from the database by using the k-nearest neighbours algorithm on the generated histograms
- **State Estimation of a Quadrotor using On-board Camera and IMU** — MATLAB ·
  - Computed SIFT features for each image in database and queries using OpenCV's built-in SIFT feature extractor
  - Employed the k-means clustering algorithm to compute 800 cluster centroids to be used as visual words to generate a histogram of visual words in each image
  - Computed histograms of visual words for all the query images and database images and extracted similar images from the database by using the k-nearest neighbours algorithm on the generated histograms

TECHNICAL SKILLS

- **Languages**: Python, C++, CUDA, Bash, MATLAB
- **Frameworks**: PyTorch, Keras, TensorFlow, OpenCV, Open3D
- **Tools & Platforms**: VSCode, Vim, Git, GitHub, SLURM
- **Operating Systems**: Linux, MacOS, Windows