ADITYA WAGH

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Computer Vision Engineer skilled in Detection, Segmentation, Multi-view Geometry, 3D Reconstruction, Visual-Inertial Odometry, SLAM, Sensor Fusion, Bundle Adjustment, and LiDAR Point-cloud Processing.

EDUCATION

- **New York University** — **New York City, NY**
  MS in Robotics & Electrical Engineering; GPA: 3.5/4 — *Sep 2021 – May 2023*
- **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 models to improve **pair-wise registration of LiDAR point cloud with a low overlap ratio**
  - Experimented with **machine learning** based **outlier rejection** techniques to find the low overlapping region.
- **New York University** — **New York City, NY**
  Graduate Teaching Asistant — *Sep 2022 – Dec 2022*
  - Co-taught the ROB-GY 6203 Robot Perception course – a graduate level course on **3D Computer Vision**.
  - Designed and graded homeworks, coding assignments and exams.
- **Central Electronics Engineering Research Institute** — **Pilani, India**
  Deep Learning Intern — *Jul 2018 – Dec 2018*
  - Fine-tuned a Mask-RCNN model for instance segmentation of power cables on this new dataset and achieved a test accuracy of approximately 70%
  - Contributed to the pixel wise ground truth annotation of a novel data set consisting of 6000+ Infrared and RGB aerial images of power cables

PROJECTS

- **Deep Image Matching using Local Feature Trasformers** — PyTorch, Kornia, OpenCV ·
  - Pass
- **Visual Place Recognition using Bag of Visual Words** — OpenCV, Sklearn ·
  - Developed a **visual re-localisation** & **loop-closure** tool to identify a previously visited location from a database of images of visited location.
  - Used **Scale-invariant feature transform (SIFT)** to extract features, **k-means clustering** algorithm to generate visual words, and **k-nearest neighbours (kNN) ML algorithm** to find matching images using these visual words.
- **Marker based Augmented Reality** — OpenCV ·
  - Developed a **augmented reality (AR)** application to project a virtual cube on a fiducial marker in the real world
  - Calibrated the camera, detected **AprilTag** fiducial marker interest points, solved a **Perspective-n-Point (PnP) problem** to establish 3D-2D correspondence, and projected world points on the image to construct a virtual cube.
- **Post-Earthquake Damage Assessment using Fully Convolutional Networks** — Tensorflow, Keras ·
  - Designed fully convolutional **neural networks** for **multi-task semantic segmentation** of building components and their damage state using a **shared backbone and multiple heads**
  - Achieved a mAP of 97% over 5 component classes and mAP of 70% for 5 damage state classes
- **State Estimation of a Quadrotor Drone using On-board Camera and IMU** — MATLAB ·
  - Pass

TECHNICAL SKILLS

- **Languages & Frameworks**: **Python**, **C/C++**, Bash, MATLAB, SQL, **CUDA**, Rust, HTML, CSS, **PyTorch**, Keras, TensorFlow, **OpenCV**, Open3D, Scikit-learn, Pandas, Kornia, NumPy, React.js, Bootstrap,
- **Tools & Platforms**: VSCode, Vim, CMake, Ninja, Git, GitHub, **Docker**, **AWS**, SLURM, High Performance Computing (HPC), Linux, MacOS, Windows