ADITYA WAGH

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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 Machine Learning, Foundations of Robotics, Probabilility & Stochastic Processes

- **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 pixel wise ground truth 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

- **Post-Earthquake Damage Assessment using Fully Convolutional Networks** — Tensorflow, Keras ·
  - Designed fully convolutional networks for multi-task semantic segmentation of building components and their damage state using a shared backbone
  - Utilized 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
- **Two-View Geometry based Relative Pose Estimation** — OpenCV ·
  - Calibrated a camera using a calibration rig and removed radial distortion from the input images using the obtained camera matrix and distortion coefficient
  - Computed the fundamental matrix using the normalized 8 point algorithm and obtained the essential matrix using the fundamental matrix and camera matrix
  - Decomposed the essential matrix to obtain the orientation and translation vectors between the images
- **Marker based Augmented Reality** — OpenCV ·
  - Obtained interest points to compute the epipolar geometry by detecting the corners of an AprilTag fiducial marker
  - Solved a PnP problem to compute 3D to 2D correspondence between the marker corners and face of a cube in 3D space
  - Projected 8 corners of the cube on the image and constructed an AR cube by joining the points

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