

Aditya Wagh

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EDUCATION

- New York University** **New York City, NY**
Master of Science in Mechatronics and Robotics; GPA: 3.667/4 Sep. 2021 - May. 2023
- Birla Institute of Technology and Science, Pilani** **Pilani, India**
Bachelor of Engineering in Electronics and Instrumentation Aug. 2015 - May. 2019

EXPERIENCE

- Central Electronics Engineering Research Institute** **Pilani, India**
Deep Learning Intern Jul. 2018 - Dec. 2018
 - Data Annotation:** Contributed to the pixel wise annotation of a novel data set consisting of 6000+ Infrared and RGB aerial images of power cables.
 - Mask RCNN:** Fine-tuned a pretrained mask RCNN model for instance segmentation of power cables on the new dataset and achieved accuracy of approximately 70%

TECHNICAL SKILLS

- Languages:** Python, C++, Bash, MATLAB, \LaTeX
- Frameworks:** PyTorch, Keras, TensorFlow, OpenCV, Open3D
- Tools:** VSCode, Vim, Git, GitHub, GitHub Actions, Docker
- Operating Systems:** Linux, MacOS, Windows

RELEVANT COURSEWORK

- Robot Perception:** Protective Geometry, Camera Calibration, Sfm, Optical Flow, Tracking, Basic Deep Learning. (fall 2021)
- Robot Localisation and Navigation:** Bayes Filter, Kalman Filter, Pose Estimation, Motion Field, Slam, EKF & Pose Graph Slam. (spring 2022)
- Deep Learning:** Convolutional Neural Networks, Recurrent Neural Networks, Transformers, Generative Adversarial Networks, Deep Reinforcement Learning, Self-Supervised Learning (spring 2022)
- Mechatronics:** Basic Electronics, Actuators, Sensors, Interfacing, Micro-Controller Programming (fall 2021)
- Foundations of Robotics:** Kinematics, Inverse Kinematics, Dynamics, PID, Resolved Rate and Impedance Control. (fall 2021)
- MOOCs:** Neural Networks & Deep Learning, Mathematics for Machine Learning, Convolutional Neural Networks in Tensorflow, Introduction to Tensorflow

PROJECTS

- Fully Convolutional Networks for Post-Earthquake Damage Assessment:**
 - About:** A FCN for semantic segmentation of components of a damaged building, another FCN for semantic segmentation of extent of damage.
 - Model:** Designed two networks with a symmetric encoder and decoder, one to classify building components and another to detect damaged components.
 - Metrics:** Achieved a mean IoU of 83% over 5 component classes and mean IoU of 70% for 5 damage states.
- Variable Computation in Recurrent Neural Networks:**
 - About:** A NumPy implementation of the paper [arxiv:1611.06188](https://arxiv.org/abs/1611.06188)
 - Model:** Implemented a learnable scheduler which varies the amount of computation based on data provided to the neural network.
 - Metrics:** Achieved a 50% reduction in the number of computation for text data.
- Kinematic and Dynamic Control of a KUKA Manipulator:**
 - About:** A robot controller for the KUKA 7-joint manipulator.
 - Kinematics & Dynamics:** Developed the forward and inverse kinematic and dynamic model of the manipulator.
 - Controller:** Designed and compared a PID Controller, Resolved Rate Controller and an Impedance Controller for the manipulator.
- Smart Pet Feeder:**
 - About:** A bluetooth operated automatic feeder with an accompanying android app.
 - App:** Designed an android app to control 3 features of the feeder - drop food, disable feeder and reset food drop count.
 - Interfacing:** Employed a HC-06 bluetooth module to connect a BASIC Stamp micro-controller to the mobile app.
 - Chasis Design:** Designed and 3D printed CAD models of the chasis of the feeder.
- Tango+:**
 - About:** A Tango inspired color scheme for Visual Studio Code.
 - Metrics:** Attracted 850+ downloads on the Visual Studio Marketplace
- Clean Portfolio:**
 - About:** A portfolio page theme for the Jekyll static site generator.