Machine Learning II Project Proposal

- **What Problem did you select and why did you select it?**

After a hurricane, damage assessment is critical to emergency managers and first responders so that resources can be planned and allocated appropriately. One way to gauge the damage extent is to detect and quantify the number of damaged buildings, which is traditionally done through driving around the affected area. This process can be labor intensive and time-consuming. therefore, utilizing the availability and readiness of satellite imagery, the efficiency and accuracy of damage detection can be improved using image classification algorithms.

- **What dataset will you use? Is it large enough to train a deep network?**

The dataset consists 23,000 square sized images from satellite imagery of buildings before and post 2017 Hurricane Harvey. The buildings are labeled as "Flooded/Damaged" or "Undamaged". This dataset can train a deep network.

- **What deep network will you use? Will it be a standard form of the network, or will you have to customize it?**

CNN will be used to solve this binary classification problem. During this project, different forms of this network will be used including using pre-trained model such as VGG16.

- **What framework will you use to implement the network? Why?**

Pytorch will be used to train this network to utilize its various imperative advantages for computer vision applications such as dynamic computational graph support that allows programmatical changes of network behavior during runtime. This improves the efficiency of the model's optimization.

- **What reference materials will you use to obtain sufficient background on applying the chosen network to the specific problem that you selected?**

Pytorch documentation and a variety of opensource code will be utilized to help in applying several techniques such as transfer learning.

- **How will you judge the performance of the network? What metrics will you use?**

Model's accuracy and f1 score will be used as metrics for the model's performance.

- **Schedule for completing the project.**

Date	Task	Details
04/06/2021	Import Data	Reading images and defining label
04/13/2021	Modelling	Train different network architectures and evaluate results
04/20/2021	Modelling	Finalize modelling and save best model
04/27/2021	Report and Presentation	Finish writing the report and record the presentation