Proposal

Flooding Damages Detection from Post-Hurricane Satellite Imagery Based on Convolutional Neural Networks

Bixuan Huang
George Washington University
bixuan@gwu.edu

Weining Hu
George Washington University
whu369@gwu.edu

This project aims to use convolutional neural network (CNN) to classify post-2017 Hurricane Harvey satellite images into two categories, which are damaged region and undamaged region. We obtained the dataset from Kaggle and the dataset contains 23,000 satellite images of size 128 X 128 and in the format of JEPG.[1] Considering all currently publicly available online coding scripts[2] associated with this dataset were achieved using Keras, we plan to implement our network using Pytorch, allowing more flexibility for us to make improvements and to distinguish our work from the existing solution. The original work associated with this dataset was published as a paper[3] in the *Institute of Electrical Engineering Journal* in December 2018, therefore much of our inspiration for building the model originated from that particular academic paper. We will use confusion matrix to evaluate the performance of the network.

Below is a rough schedule for completing this project:

Tasks	Details Breakdown	Deadline
Import Data	Reading images into variables	November 18, 2019
Modeling	Started with a VGG-16 model; Compared with other customized model; Evaluate the efficiency of the model by visualizing feature maps of varied hidden layers	December 2, 2019
Evaluation	Confusion Matrix and accuracy plots	December 6, 2019
Report and Presentation Preparation	Type up final report and prepare presentation slides	December 8, 2019

[1] https://www.kaggle.com/kmader/satellite-images-of-hurricane-damage
[2] https://github.com/qcao10/DamageDetection
[3] https://github.com/qcao10/DamageDetection