

# Individual Final Project Report

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

George Washington University  
whu369@gwu.edu  
Weining Hu

Bixuan and I completed this project together. We divided the workload of the project into two major parts. Bixuan was responsible for designing and building a custom convolutional model, while I was in charge of implementing the two pre-trained models (VGG-16 and Resnet50). During the hyperparameter fine tuning process, we first explored methods to improve our own models independently. We then exchanged our findings from our independent experiments. After constant exchange of ideas, we absorbed the advantages from the other member's work and incorporated those findings to improve our respective models. I described the portion of my work in details in section **2. Pre-trained Models** in the final group project report. I provided the results of my experiments and evaluated the performance of all models in section **4. Results**. I also summarized the conclusion of our project in section **5. Conclusion**.

I presented my individual code in the file titled "*Pretrained\_Model.py*." The code shows how I load the data, apply image augmentation on images, train the pre-trained models (VGG-16 and Resnet50), make predictions on the hold out test set, and make line plots and confusion matrix to evaluate the performance of the models. I borrowed codes from Will Koehrsen<sup>1</sup> when drafting the section to replace the classifiers of the pre-trained models with my own custom classifier. Other than this part, the rest of the code is mostly my individual work. The percentage of the code that I found or modified from the internet is roughly 41%.

---

<sup>1</sup> [https://github.com/WillKoehrsen/pytorch\\_challenge/blob/master/Transfer%20Learning%20in%20PyTorch.ipynb](https://github.com/WillKoehrsen/pytorch_challenge/blob/master/Transfer%20Learning%20in%20PyTorch.ipynb)