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# Practices on Visual Computing I - Template for Project Idea

## Project Name

Building Flood Damage Extent Detection and Classification Using Satellite Imagery and Meta-Attributes

### Description

The project is to classify building flood damage extent based on pre-disaster and post-disaster satellite images and meta-attributes such as elevation and land cover by LiDAR (Light Detection and Ranging) data using novel deep learning models. The usage of satellite images provides the opportunities for real-time and large-scale building damage assessment; the assistance of other meta-attributes complements the limitations of satellite images. For practical applications, due to the scarcity of annotated data in rapid emergency response as well as the occurrence of cloud occluded areas during flooding, generative models are recommended to use for domain adaptation or cloud removal, etc.

Students are expected to use multiple algorithms and libraries, train multiple models, and report on comparative performance of each one.

Performance of the models should be described by their accuracy and recall scores, but it should also include a time performance factor in the application of the model.

Usage of open source programming languages and libraries are encouraged.

### Datasets

Students can use a high-resolution satellite imagery dataset containing the satellite images before and after Hurricane Harvey in Harris County, Texas (US) with damage extent labels based on property flooding claims. Usage of other public datasets such as xBD, a building damage satellite imagery dataset, are encouraged as well. Other attribute data includes but is not limited to building footprints, elevation, land cover, and rainfalls.

### Contact Person

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### Contributor of the Project Idea

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