Project Title:

**Automatic Retrieval of Satellite Imagery for Flood Mapping Visualization**

**Project Description:** This project aims at developing a web application to automatically retrieve different types of satellite imagery which will be run through existing machine learning models for flood detection in order to visualize the flood extent on a dashboard.

The first task will involve creating an interface to allow users to select three types of input: 1) selecting one or more area of interests from a map-based interface via bounding box or administrative boundaries, 2) selection of date interval based on flood duration, and 3) type of satellite source with an option to select one, more than one, or all sources, which will be used in determining the automatic retrieval of satellite imagery. Existing scripts will be provided to automatically download the images, which will then have to be visualized on the webpage. The second task would involve running the downloaded images through existing flood detection models to then visualize the output of the flood extent on the webpage. The last task then requires the creation of an improved dashboard of the input (raw imagery) and output (flood extent) images, where all the images of past flood events can be visualized, whilst also allowing users to upload new images and visualize the flood extent.

**Project Type:** Engineering

**Duties/Activities:**

- Design an interface that automatically finds all the available satellite imagery for a given area of interest (AOI) and visualize it on a web page
- Run existing flood detection models on the imagery to visualize the output on the web page
- Improve the web page UI/UX by creating a dashboard view to visualize all past imagery with their predictions,
- The system should be able to handle single and batch processing of AOI’s

**Required Skills:**

- Web application development in Javascript, PHP, HTML, CSS, jQuery, Bootstrap
- Restful API (Django, Flask etc.) for backend integration
- Proficiency in Python

**Preferred Intern Academic Level:** Preferably a 3rd or 4th year student in a technical related undergraduate program e.g. Information Systems and Computer Science who has the required skills and is a self-learner/self-motivated to gain new skills in remote sensing and machine learning.

**Learning Opportunities:**

- Will be exposed to the field of remote sensing, where interns will understand the different types of imagery and interact with existing APIs, which will open up more career opportunities for students in the future
- Will be exposed to the field of machine learning where the students will be exposed to working with existing machine learning models, and this will benefit the interns as they will learn a new skill set.
- The end application produced by the intern will be used within the Social Computing team so this internship project will prove impactful.
**Bonus Tasks if time permits:**

- Display the latest flood events so users can click on it and download the imagery and get the flood detection results
- Display the media coverage of the flood events e.g. number of lives lost, area of crops destroyed etc.

**Expected Team Size:** 2

**Mentors:**

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