

# CMPT 733 Big Data Programming – Final Project

## Call for Project Idea

### Title of the Project: Automated Feature Detection of Aerial Imagery from South Pacific

#### Description:

In partnership with WeRobotics and OpenAerialMap, the World Bank's UAVs for Disaster Resilience Program captured ~80km<sup>2</sup> of high resolution (under 10 cm) aerial imagery in one Small Island State in October 2017. We now seek qualified teams to develop machine learning classifiers to automate the analysis of this imagery. The classifiers will also be applied to new imagery to speed up baseline analysis and damage assessments in the future.

The following classifiers are required in order of priority:

- **Crop type** (papaya, banana, mango, watermelons and taro). Aside from coconut trees, most crop fields in imagery are expected to be single-crop fields.
- **Counts of coconut trees**
- **Road type** (surfaced/non-surfaced, dirt road roughness)
- **Road conditions** (good, poor; disconnected sections; presence of potholes and cracks)

Parameters for classifiers:

- Use imagery from the **50km<sup>2</sup> AOI** which has 8cm spatial resolution.
- Resulting **data made available** in GeoJSON (or other open geospatial vector / raster file format as appropriate).
- The **accuracy** of the classifiers should be **>80%**.
- User should ideally be able to run these classifiers using simple **web-based interface**.

Initial classifiers would ideally be available by **March 2017** with remaining classifiers delivered before June 2018.

#### Datasets

The imagery collected in October comprises four Areas of Interest (AOIs). Three AOIs cover 10km<sup>2</sup> areas and one AOI covers a 50km<sup>2</sup> area. The spatial resolution of the optical imagery is 4cm and/or 8cm depending on the AOI. In addition, an AOI of 10km<sup>2</sup> was collected using a near-infrared sensor. Optical imagery is also available for that same AOI. In general, the AOIs cover a combination of rural and urban areas. Some buildings and roads have been manually labeled in some AOIs.

#### Contact person:

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#### Contributor of the Project Idea:

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