Hawk

Milestone Presentation

The Open AI Challenge

Task: Automated Feature Detection of Aerial Imagery from South Pacific

Current Efforts: Manual analysis of aerial images (takes more than a day!)

Goal: Develop machine learning classifiers to automate analysis of aerial imagery

- Locate and count individual trees
- Road types

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Impact

Assessment and efficient aid distribution after major disasters

Secure food sources

Assess road conditions for aid distribution

Training Datasets

Around 80 KM^2 of a high resolution image

Kingdom of Tonga

Shapefiles with coordinates


```
{
  "type": "Feature",
  "properties": {
    "osm_id": "5269773585",
    "name": null,
    "barrier": null,
    "highway": null,
    "ref": null,
    "address": null,
    "is_in": null,
    "place": null,
    "man_made": null,
    "other_tags": "\"natural\"=>\"tree\"
      ,\"species\"=>\"Cocos nucifera\""
  },
  "geometry": {
    "type": "Point",
    "coordinates": [
      -175.3377829,
      -21.0877766
    ]
  }
```

Approach

- Crop image patches from provided dataset to generate training set

  Challenge: Dense/sparse tree areas, different weather conditions

- Fine-tune pretrained CNN model with obtained training data

  Challenge: Choose the right model/parameters for >80% accuracy

- Provide web interface for users to run object detection and classification task

Targets Achieved

Data Cleaning and Coordinate Extraction

Around 7000 Coconut Trees obtained

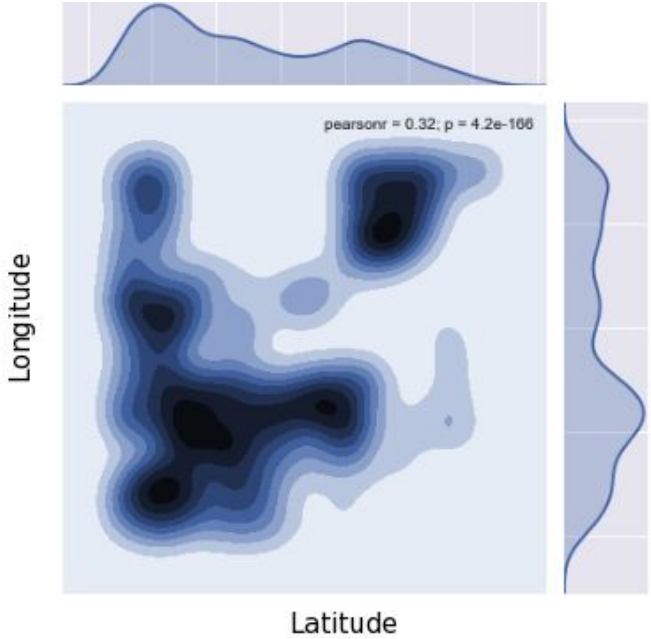
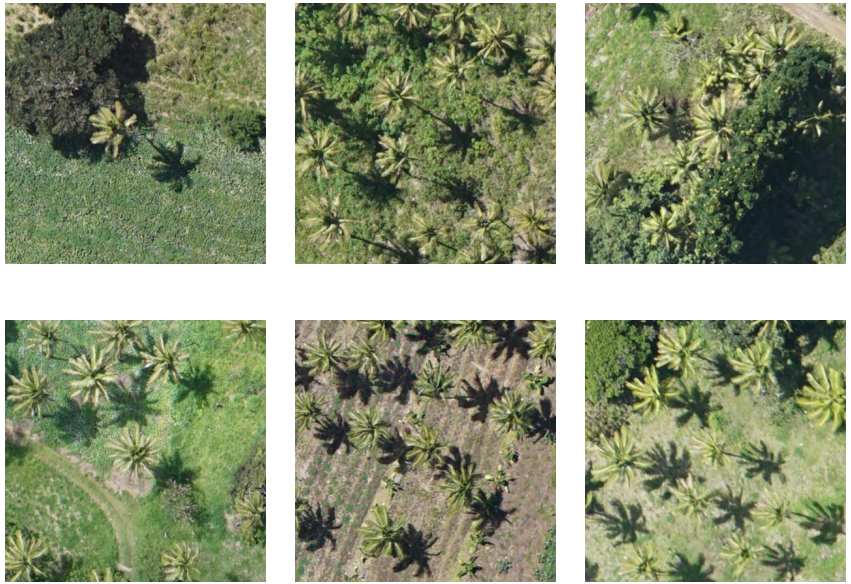


Image Chunking by Coordinates



Problem!

Data provided is slightly inaccurate

Need for manual annotation and generating bounding boxes

Next in Pipeline

- Try different CNNs pretrained on ImageNet and fine tune them
- Build Web-based Interface and Service specifically for **AID** (Aerial Imagery Detection)
- Augment training data to mimic different weather conditions