# Web Visualizer for Functional Map Of The World

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September 20, 2022

## 1 Abstract

Data plays a crucial role in enabling businesses around the world to make well informed decisions to benefit their company and help them achieve their goals. Data Analysts are employed by these companies to dissect tons of data as well as perform trend analysis. Traditionally, data is collected through surveys, interviews, web scraping and observation, but images are also a useful form of data. By classifying images with the use of deep learning models, as well as analyzing the metadata associated with these images such as date, time and location, substantial information can be extracted from huge datasets consisting of images to guide businesses in making decisions. Within this research, we will use the functional map of the world (FMOW) dataset that is publicly available and investigate and model which regions have high activity based on metadata and temporal data. An interactive web visualization will also be built based on the data analysis and model. We also hope to augment our visualization with other datasets in order to answer different research questions.

## 2 Research Questions

This research will attempt to answer the following research questions:

1. What areas are experiencing high activity? How does the landscape change over time?(Nature, human activity, etc.)
2. Are there any strong correlations between abundance(or lack of) of sites in specific geographic regions? Why could this be so?

## 3 Dataset

For this research, we will use the dataset from the functional map of the world (https://github.com/fMoW/dataset). This dataset includes over 1 million images with metadata such as UTM zones that provides location context, temporal sequences with labels and annotations for buildings and other structures in the images. The full dataset is in Tagged Image File Format(TIFF) format, contains 4-band and 8-band multispectral imagery which comes in around ∼3.5TB while the RGB dataset is in JPEG format, with multispectral being converted to RGB. It is significantly smaller in size at around ∼200GB

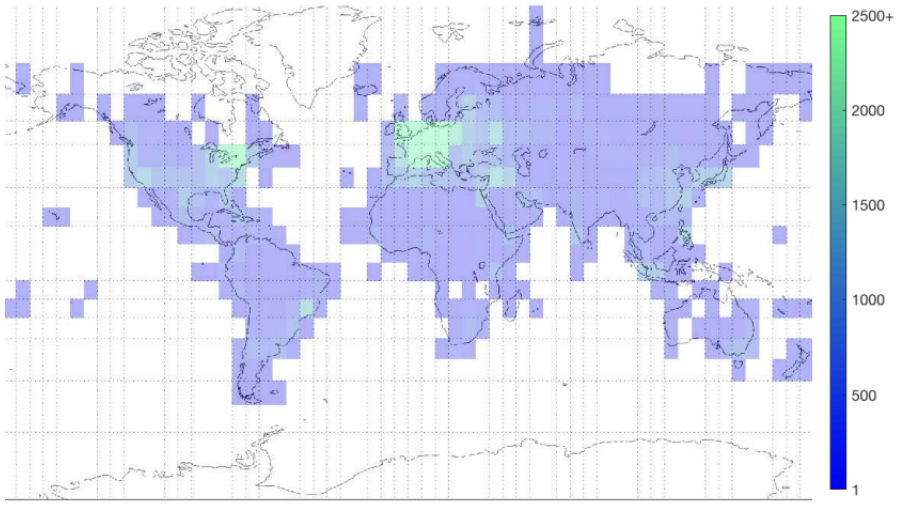


Figure 1: UTM zones of dataset, where green shows higher counts of instances in the data and blue for lower counts.

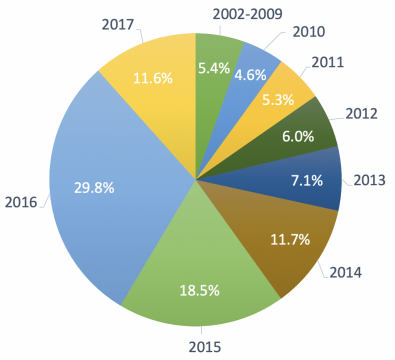


Figure 2: Year Distribution of Images

## 4 Proposed Approach

To answer our research questions, we will follow the model outlined below.

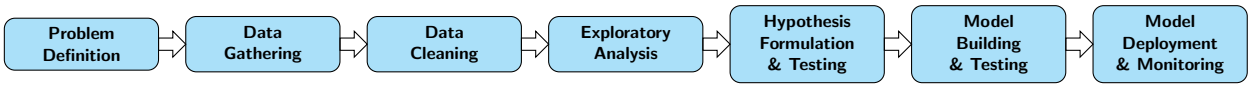


Figure 3: Process Workflow

This project will include a web visualizer featuring the regions and locations of the images and show activity based on the temporal sequences of the dataset.

## References

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