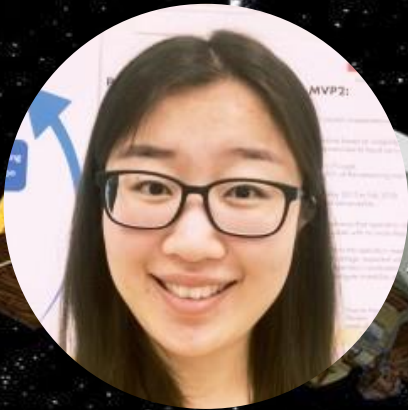# Wildfire Real Time Detection System using Satellite Imagery

Disha An
Data Scientist – Shell

Boran Han
AI resident – Shell

Yanxiang Yu
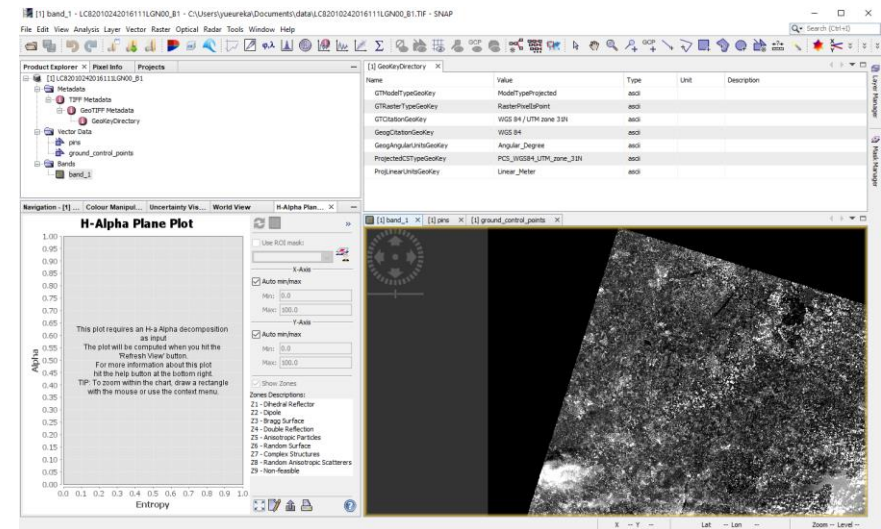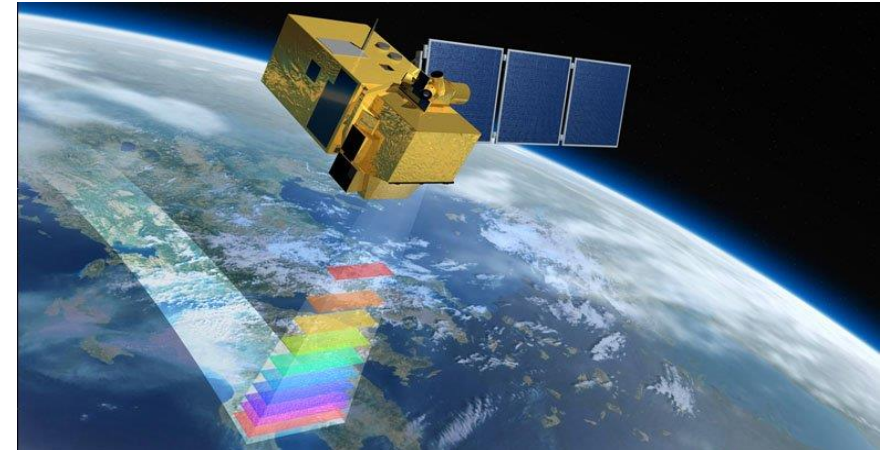**AI resident – Shell**

Zhijuan Zhang
Data Scientist – Enbridge

The Inspiration

California's 2018 Wildfires Have Emitted A Year's Worth of Power Pollution
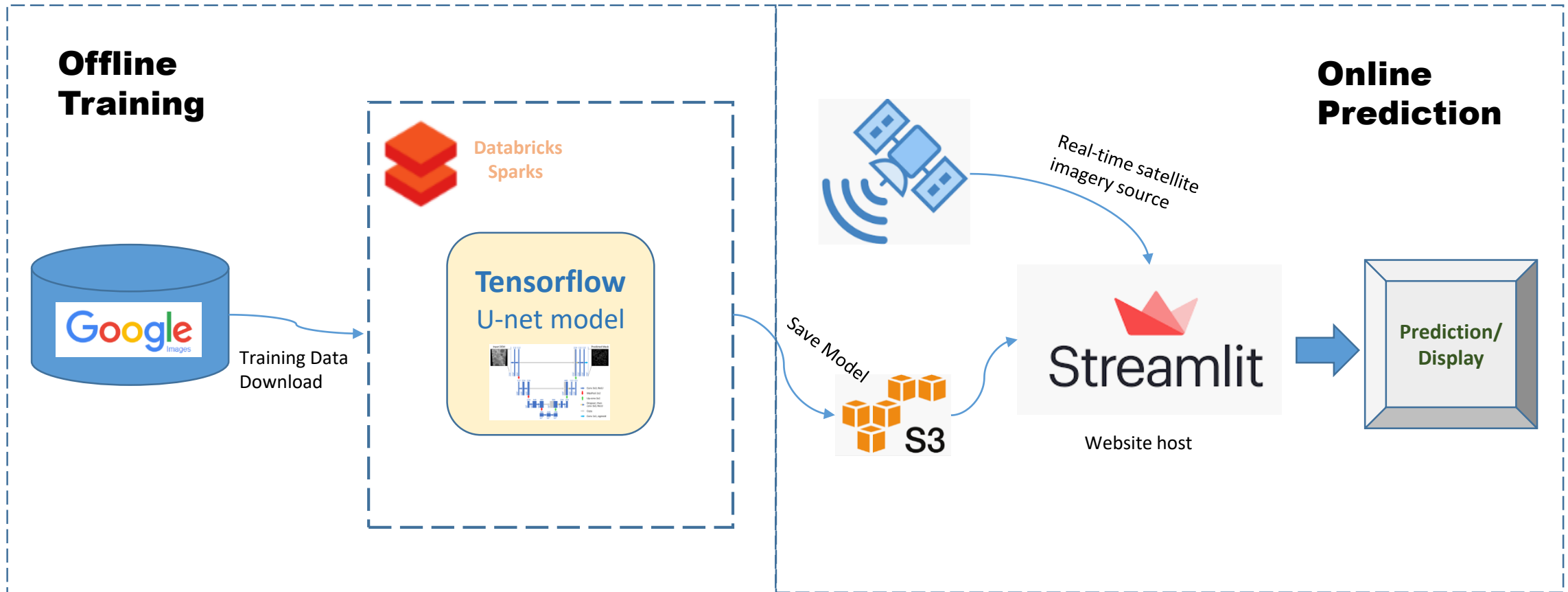
Issues with existing methods

- Dedicated EO satellites only cover small portion of area.

- Orbiting causes the monitoring with long delay and discrete.

- Requires extensive specialties and dedicate preprocessing skills.
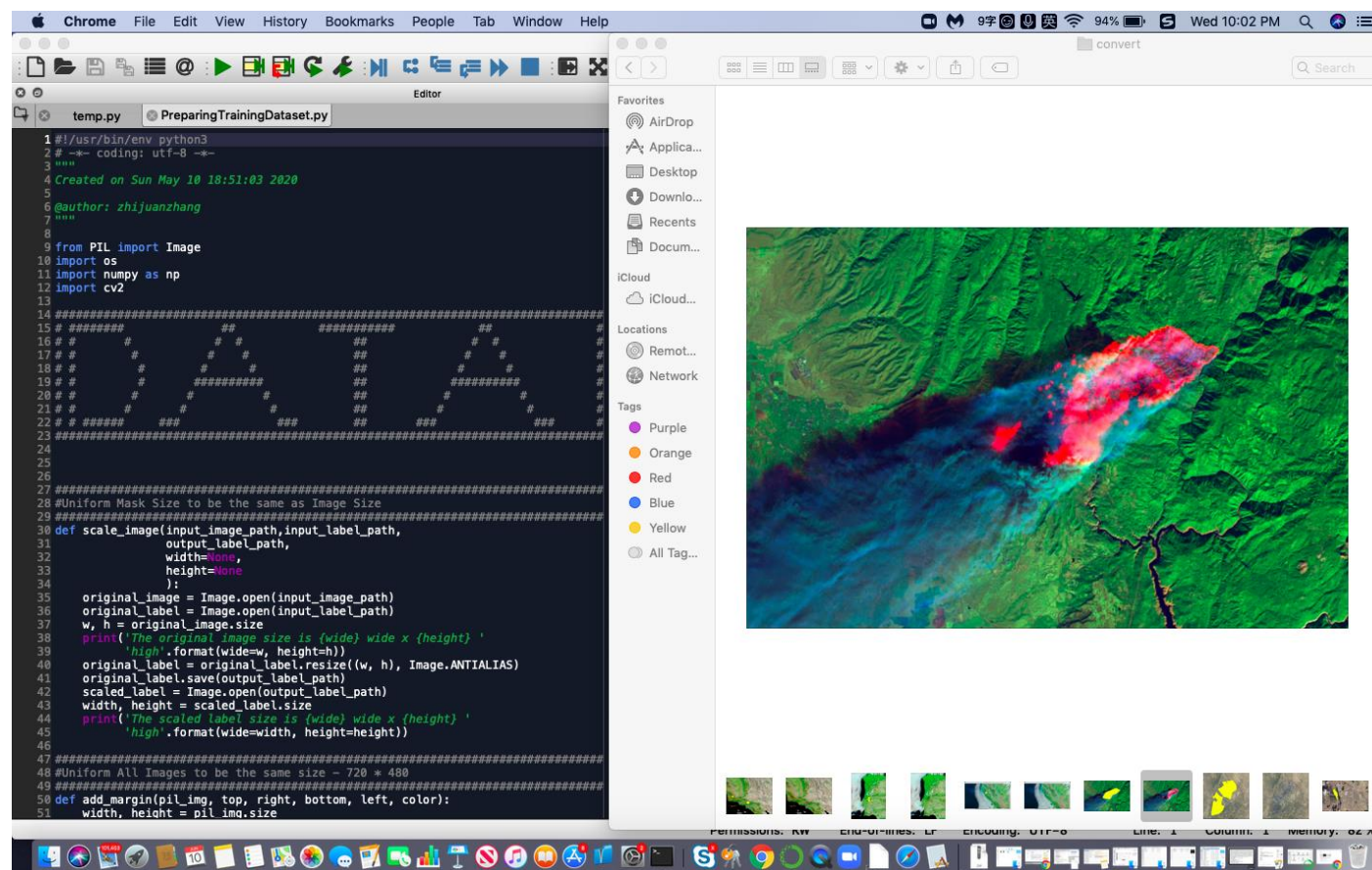
- Hard to process in real time.

Workflow

Offline Training

Google Images

Training Data Download

Databricks Sparks

Tensorflow
U-net model

Save Model

S3

Online Prediction

Real-time satellite imagery source

Streamlit

Website host

Prediction/ Display

Dataset Preprocessing

- Batch downloaded images using Google Image API.

- Manually contour the burning scar zones as the label.

- Resize and padding the images, and conduct data augmentation.

Databricks Setup

Deep Learning Model: U-Net

- U-net learning segmentation in a end-to-end fashion.

- We trained on 110 images with labels
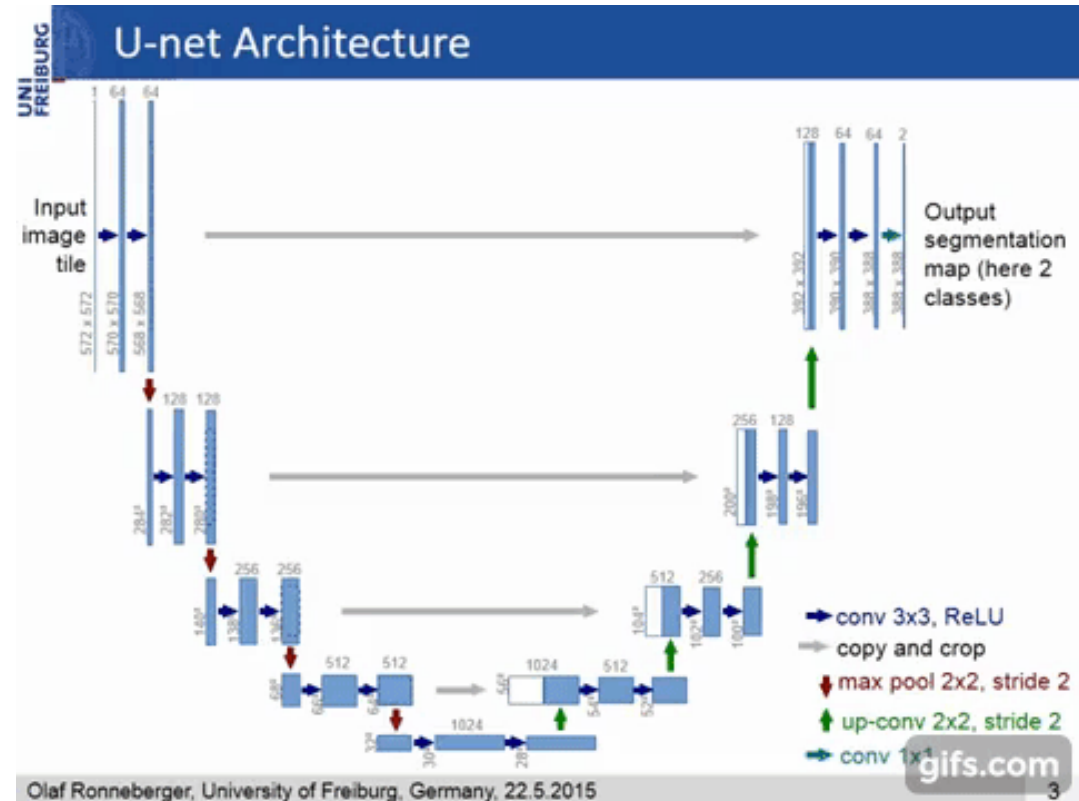
Prediction Results
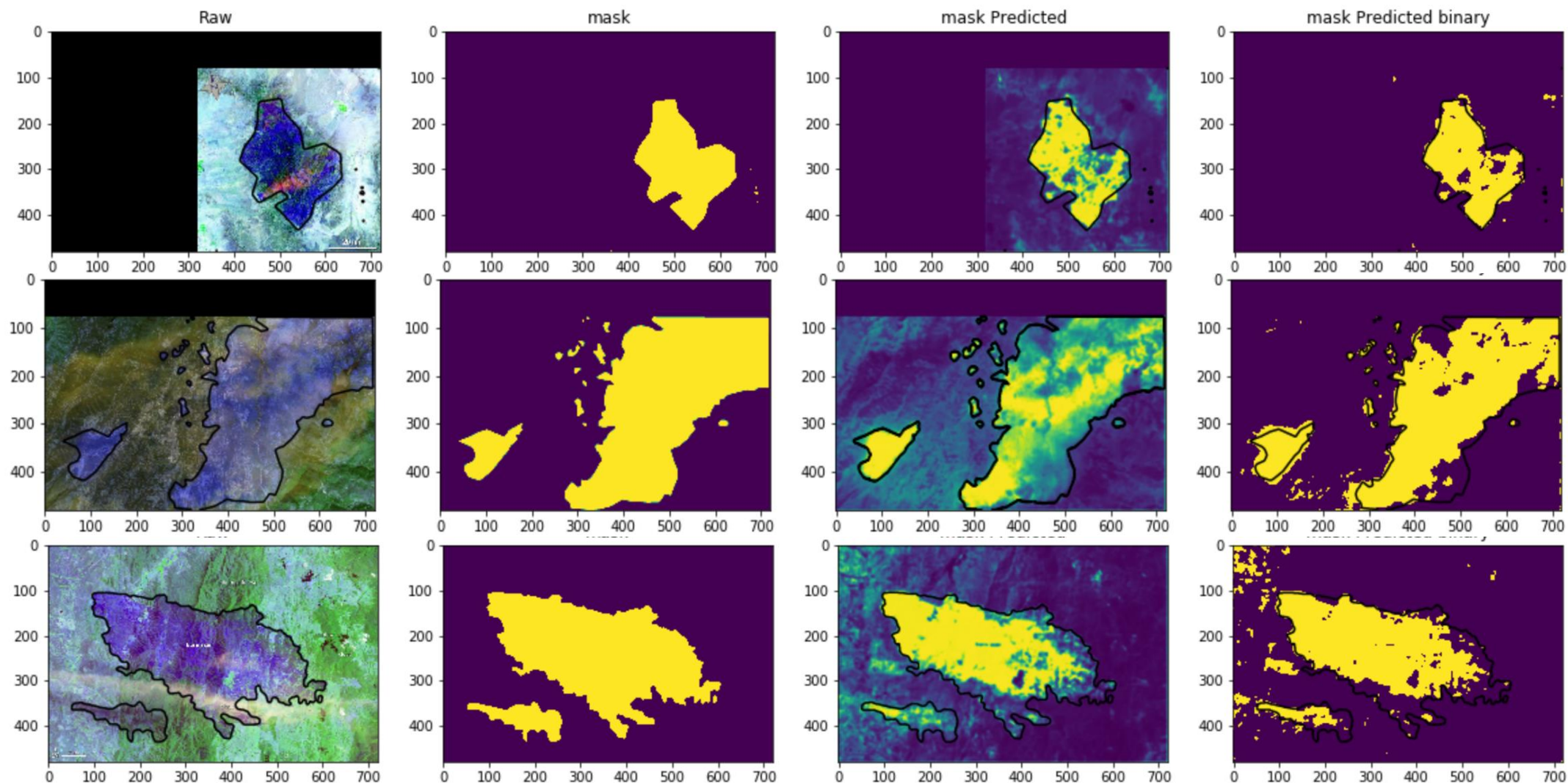
Use the Application

- Deployed on Streamlit with the Docker Container.

- Simple to use: directly drag and predict the imagery;

- Predict the CO_2 emissions and burning area given by the input parameters.