Flood Measurement from a Photo

By

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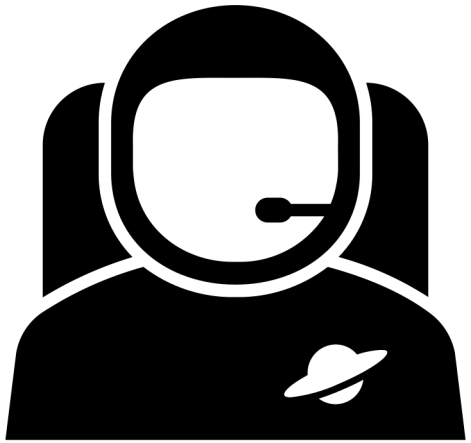
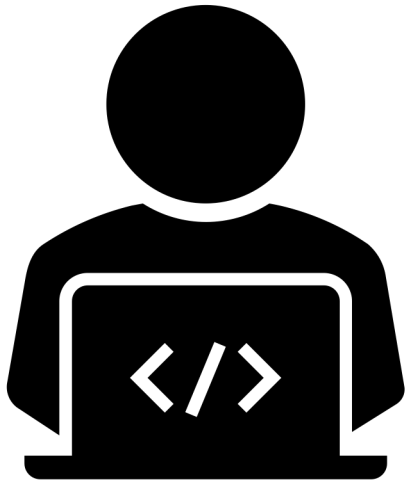


Clint Hoke



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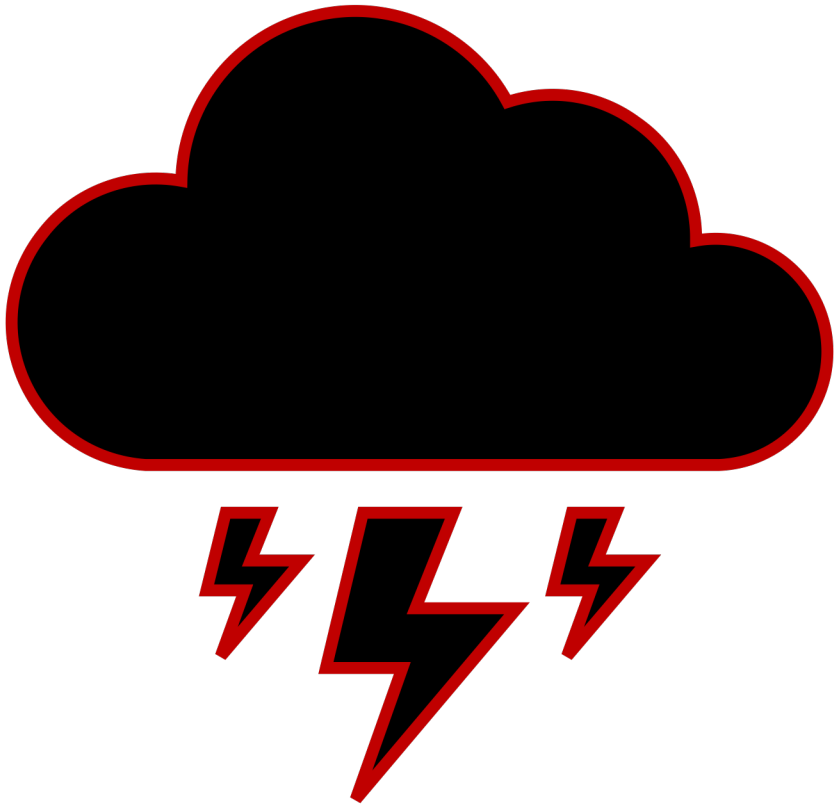
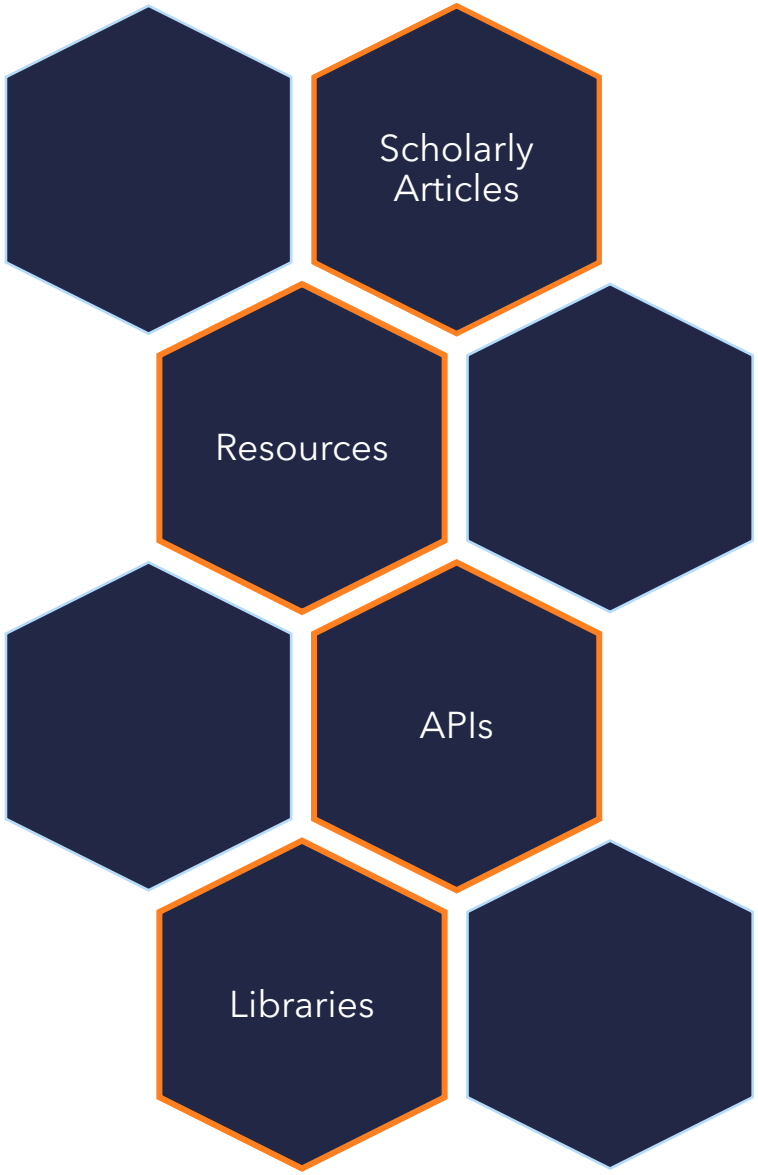
Partners

Agenda

- Problem Statement
- Research
- Solution
- Issues

Problem: Create a machine model that can detect flood depth from a photo.

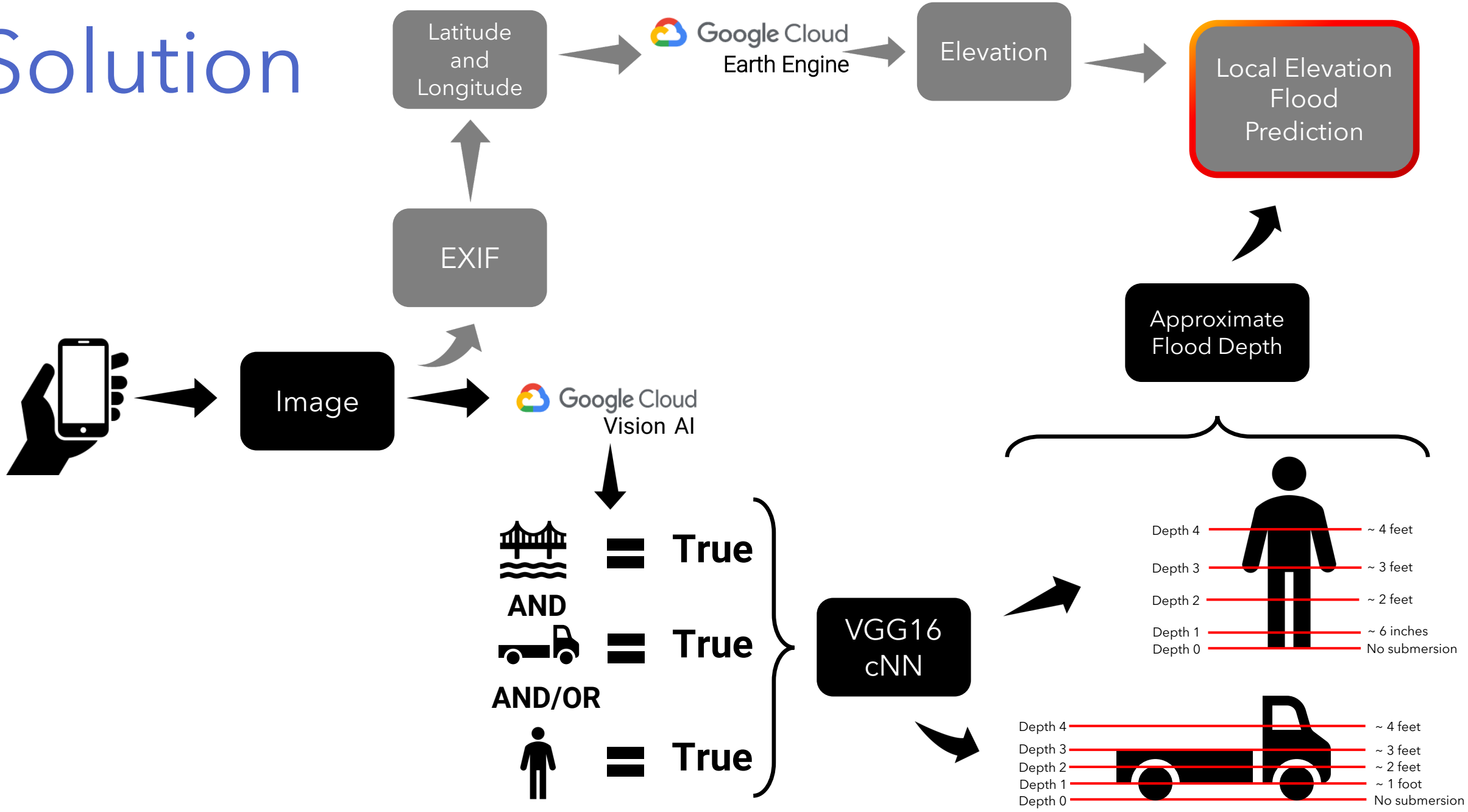




Research

*Full list of research available here

Solution

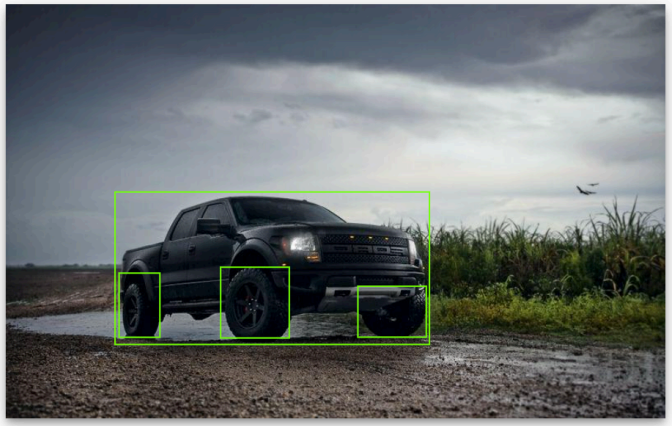

Latitude and Longitude
Google Cloud Earth Engine
Elevation
Local Elevation Flood Prediction
EXIF
Approximate Flood Depth
Image
Google Cloud Vision AI
True
AND
True
AND/OR
True
VGG16 cNN
Depth 4
~ 4 feet
Depth 3
~ 3 feet
Depth 2
~ 2 feet
Depth 1
~ 6 inches
Depth 0
No submersion
Depth 4
~ 4 feet
Depth 3
~ 3 feet
Depth 2
~ 2 feet
Depth 1
~ 1 foot
Depth 0
No submersion

Objects | **Labels** | Properties | Safe Search

hflip_img_test_depth_0_002.jpg

- Land Vehicle 100
- Vehicle 99
- Tire 98
- Automotive Tire 97
- Car 95
- Off-roading 92
- Wheel 91
- Automotive Design 89

Objects | Labels | Properties | Safe Search



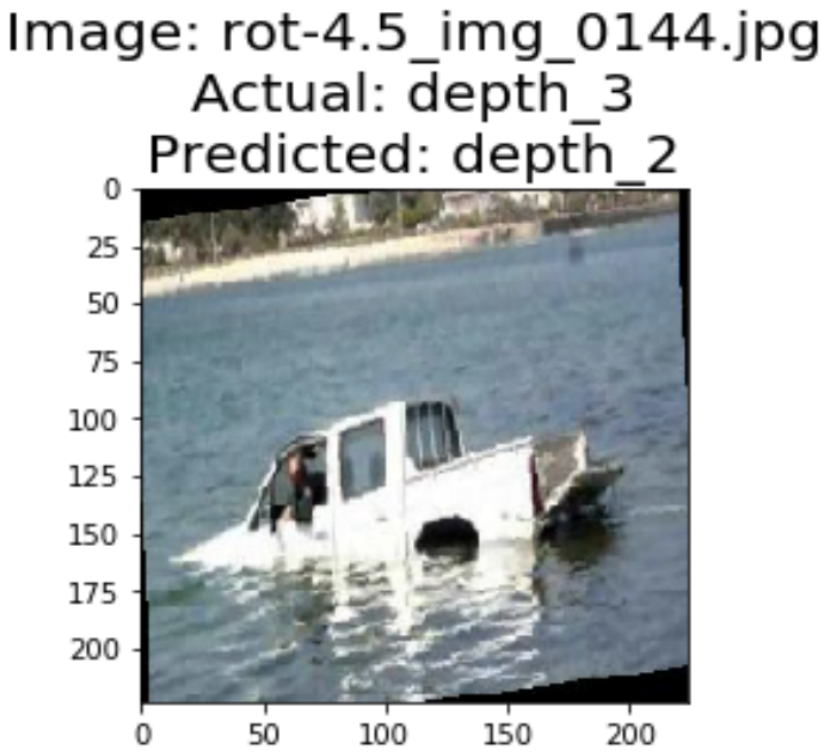
hflip_img_test_depth_0_002.jpg

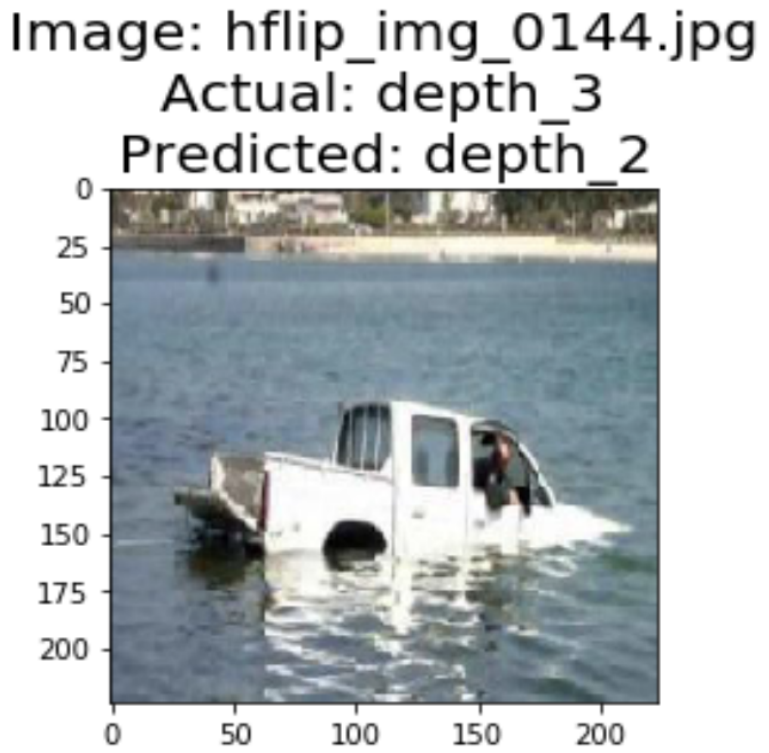
- Wheel
- Truck
- Wheel
- Tire

Google Vision AI

- Paid Service
- Detect objects automatically
- Data labeling service
- Image pre-processor
- API was used to run batches of images

Image Processing





Results

Issues

- need more photos
- may need to remove complex photos to avoid training issues
- shifting images augments the list, but filling with neighbor pixel creates striping
- we didn't realize that the ImageDataGenerator would do the crop, so we cropped externally (sorry, Josh!!) and some images have black bars. Unclear if the model is training on this instead of the photo content

Questions