

Classifying the Right-Of-Way for San Francisco

Using Semantic Segmentation on SkySat Ortho Imagery

MUSA 650 Preliminary Report
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It is financially and administratively difficult for the GIS departments of American cities to constantly update basic datasets. One large dataset that is rarely create or update is Right-of-Way polygons – even though many public and private stakeholders lean on that dataset to understand other urban trends. When looking at satellite imagery, it is easy for the human eye to classify what surfaces are asphalt, where the curb/sidewalk starts, and what isn't a road. With that in mind, I want to use semantic segmentation on satellite imagery to classify areas that are the right-of-way.

My process is to (1) use multiband, higher resolution satellite imagery (1-5meter pixels?) as the input data of a neural network and (2) right-of-way polygons as the ground truth data. I will be focusing on San Francisco since the city's GIS team has a fairly clean and updated right-of-way polygon dataset. Once I find the appropriate high-resolution imagery, I will form a fishnet grid based on the pixel size. With the fishnet, I will cut the right-of-way polygons then only select the fishnet cells that don't contain right-of-way polygons that are on freeways or in underground tunnels. The fishnet cells of right-of-way polygons will then be transformed to TIFs of equal size of the satellite imagery.

Datasets

- Right-of-Way Polygons (2019)
 - Used to create the ground truth of right-of-way
 - [San Francisco Open GIS](#)
- Street Centerlines
 - Used to filter right-of-way polygons and understand which fishnets to use
 - [SF Open GIS](#):
- Satellite Imagery (?)
 - I was prepared to use this [Planet SkySat Public Ortho Imagery \(2m pixel\)](#) datasets [from Google Earth Engine](#) . . . but it was unavailable
 - I am open to anything that will give me the smallest resolution that will allow me to turn the resulting classification into a vector