

Satellite Image Classification

Using Amazon SageMaker

Difficult to Extract Information from Satellite Images

Expensive

Takes long time to process

Complex

0.3 GB per 100 sq km.
Twin Cities: 70 GB
The World: 186 TB



➔ **Big Data Solution = Amazon SageMaker + Amazon S3**

Amazon SageMaker

The first integrated development environment for ML

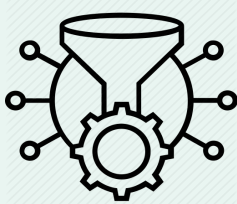
10X
90%
70%

Increase in team productivity

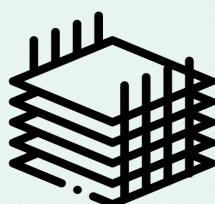
Cost reduction with managed spot training

Reduction in data labeling costs

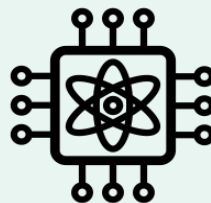
Prepare



Building



Train & Tune



Deploy & Manage



Scalability

Easy and inexpensive to scale up or down

Durability

99.999999999% durability of objects

Latency

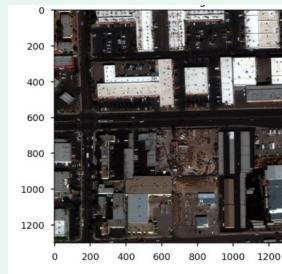
Significantly lower latency

Amazon S3

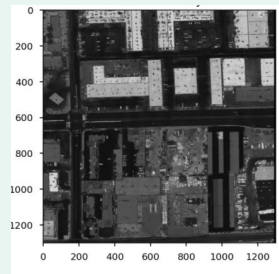
An object storage service that offers industry-leading scalability, data availability, security, and performance

3 Different Types of Data

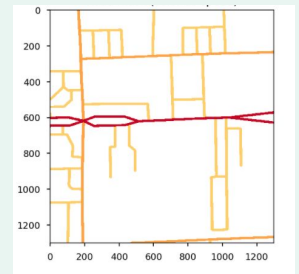
60+ GB of satellite image data from around Las Vegas



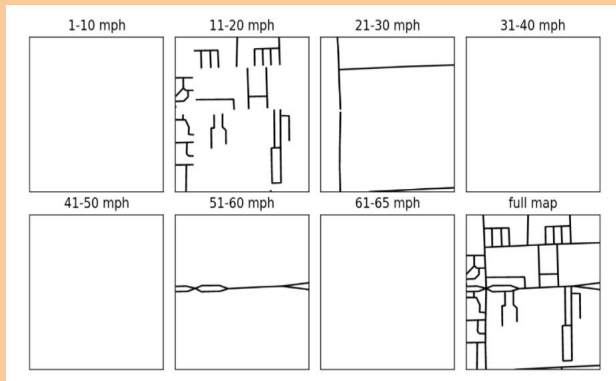
Satellite Image



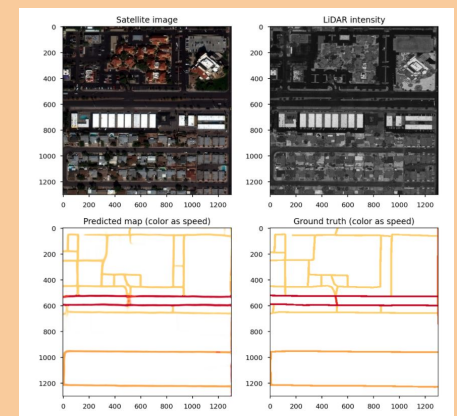
LiDAR Intensity



Road Mask

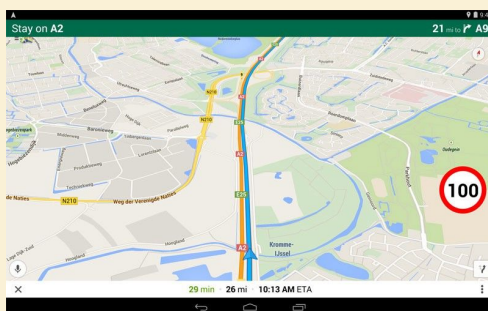


- Model predicts the maps in each speed category
- Training data is broken into 7 categories
- Predicted data is aggregated from 7 categories to 1 final map



- Train a ResNet-Unet Convolutional Neural Net model for \$14.98/hour
- Employ a pre-trained model for \$2.77/hour
- Model is able to isolate the roadways and speed limits

Information Extracted from satellite images is useful for navigation software



Source: <https://medium.com/the-technews/google-maps-will-display-speed-limits-in-navigation-7ad5dd53bac5>

- Road map and speed limit information support better navigation service.
- Autonomous vehicles can use these information to navigate themselves



Source: <https://www.youtube.com/watch?v=uVmNmVEAciE>

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