

Locating Road Fractures with Machine Learning

Introduction

Michigan is very well known for its potholes. To help solve that problem, IT Oxygen was tasked with creating an application capable of spotting road fractures in real time. This can help potholes be identified and fixed far sooner. Due to the lack of consistency among various road fractures, using machine learning made the most sense to most accurately determine the type of fracture and location.

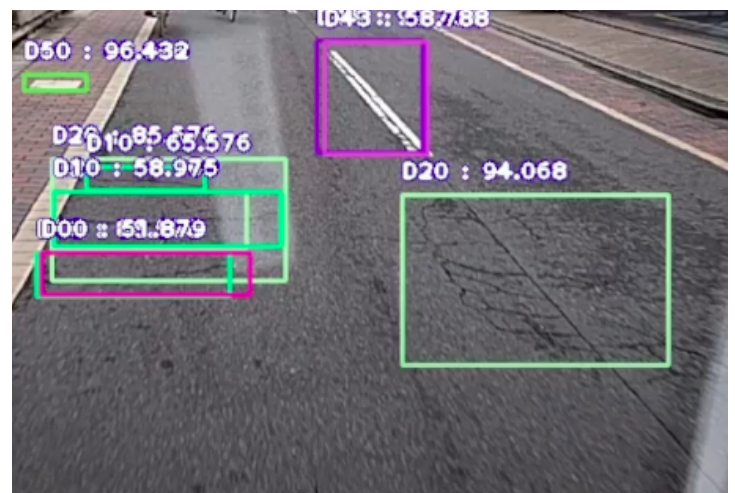
Strategy

As mentioned, the most consistent way to identify cracks in the road was to use machine learning. This entails tens of thousands of images to be used with the coordinates of the fracture, as well as the type. To be as accurate as possible, we used over 60,000 images. The data set is then run through resource intensive procedural algorithms to create an executable binary (known colloquially as a model).

On most machines the training of this model would have taken months, to find hardware capable of training in a reasonable amount of time, the team had to use TensorFlow, an open source artificial intelligence library in conjunction with Google Colab, which granted access to machines capable of handling the large data set.

Conclusions

The application can find cracks in pavement with a reasonable amount of accuracy, all with no direct human intervention. Video can be taken of the road, barring it being clear, split up into images, and then the application can determine the sections of the road that need the most attention. In the future, we can certainly even use more data to improve the effectiveness.



A piece of training data run through our application