

EE/CprE/SE 491 WEEKLY REPORT XY

10/30/2019 – 11/24/2019

Group number: 20-18

Project title: Development of Image Analysis Algorithms for Crack Detection Using a Smartphone

Client &/Advisor: Bo Yang/Halil Ceylan

Team Members/Role: Akira Demoss, Maggie Dalton, Modeste Kenne, Nik Thota

o Weekly Summary

This week our team worked mostly towards creating a dataset with which we can train a base detection algorithm and create a prototype. We have still experienced problems with setting up individual development environments so that each member can train. Moving forward, we are discussing alternative solutions for working around these issues.

o Past week accomplishments

- Nik
 - Edited Lightning Talk
 - Clipped together sound clips sent by other members and attached them to the appropriate slides
 - Fixed python path issue
 - Edited python paths to match the paths of other members
 - Continued work on trying to run example
 - Issues were found with darknet installation
- Maggie
 - Labeled images for the road dataset
 - Downloaded and learned to use labeling software
 - Placed bounding boxes around cracks to for training/testing a model to detect cracks
 - Worked on fixing model training issue
 - Redid the configuration files

- Recreated the project from scratch
 - Akira
 - Documented steps for converting a tensorflow model to tensorflowlite, including steps for using tensorboard to analyze the input and output nodes of the network.
 - Helped team members debug code for training custom neural networks using darknet.
 - Modeste
 - Installed SPICE client on my computer (windows) in order to connect to our Virtual Machine.
 - Set up virt-viewer client for graphical console
 - Set up a folder in our server that will be used to test images sent to server
- **Pending issues**
 - Maggie
 - Still having issues with the model from the previous week not detecting an object. Same issue where the detection executes but no bounding box is drawn.
 - Additional research has shown that the Google example that we were using to help create a prototype is outdated. Google has updated TensorFlowLite and the new additions would allow us to better utilize device hardware and make it easier to work with the algorithm on a mobile device.
 - Nik
 - Issues with darknet installation
 - When running the example, an error is found with darknet
 - Akira
 - Continued issue with converting the tensorflowlite file in a way that Java will accept it as a classifier.
 - Modeste
 - Not yet able to transfer images to our server

○ **Individual contributions**

<i>Name</i>	<i>Individual Contributions</i>	<i>Hours this period</i>	<i>Hours Cumulative</i>
<i>Akira Demoss</i>	Documented steps for converting a frozen tensorflow graph to tensorflowlite and helped troubleshoot issues.	16	82
<i>Maggie Dalton</i>	Labeled images, fixing model training issue	23	74
<i>Modeste Kenne</i>	Install and set up require tools to process computation on images on the server	14	46

<i>Nik Thota</i>	Edited lightening talk and continued troubleshooting and progressing training environment	15	50
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- **Comments and extended discussion**

- **Plans for the upcoming week**

- Maggie
 - Label additional images
 - A larger dataset leads to a more accurate model
 - Begin working on a base for the Android application
 - Recreate the Google example with more a more current version of TensorFlowLite
 - Begin
- Nik
 - Work on fixing issues with darknet
 - Be able to run the example completely
 - This will mean the environment is ready to go
 - Revise Design Document
 - Using notes from our meeting with our TA, make necessary changes to the format and content of the document
 - Creating the final draft
- Akira
 - Create a dataset
 - Collect hundreds of images from multiple datasets to create a unique, diverse dataset of cracks and potholes in pavement taken from a car.
 - Train data from dataset
 - Evaluate the accuracy of the dataset
 - Work on training a multiclass object detector
- Modeste
 - Lookup other methods use for sending images on server
 - Create a new Android Studio project and implement new findings
 - Push all issues to Git repository

- **Summary of weekly advisor meeting**

Updated Bo on project progress. Discussed making project documents available for Professor Ceylan to access. Talked about possible need for borrowing a department-owned

Android phone for testing on a later date. Also began to discuss the possibility of the group joining Bo/Professor Ceylan once we have a prototype to test the accuracy. This would allow us to physically measure the detected crack.