Lt David Crow

Activity Report 4

19 May 2019 – 29 June 2019

Week 1

* Extremely busy with coursework this week; did not make progress towards research

Week 2

* Met with Dr. Graham
  + Discussed possible journal (MDPI) or conference submission for AVAS project
  + Discussed inclusion of Dr. Borghetti on thesis committee
  + Discussed literature review
    - Short draft submitted for CSCE 698
* Prospectus submitted for CSCE 698
  + Committee: Graham, Borghetti, Sweeney
* Found about 25 articles
  + Saved 10 that seem promising
    - In the process of skimming these 10
  + Definitely need to continue searching
    - Will do so over break
* Still busy with coursework
  + Finished CSCE 623
  + CSCE 686 final on Monday, 3 June; report due Saturday, 8 June
    - After this, I should be free to pursue research (excluding CSCE 823)

Week 3

* Too busy with finals to work on research
  + Earned a 4.0 for the quarter though!

Week 4

* Met with Dr. Graham
  + Discussed overview of research plan for summer quarter
  + Meeting on 25 June to continue discussion

Week 5

* Downloaded CAN bus data
  + Downloaded SQLite3 and explored dataset
* Used Python/Jupyter to split dataset into nine log files, one for each vehicle tested
  + Each file is properly formatted for use in Capt Stone’s pipeline
* Cloned Capt Stone’s pipeline and successfully processed sample log file

Week 6

* Re-split the dataset into ~35 log files, one for each capture (instead of lumping together all captures from a single vehicle)
* Met with Dr. Graham
  + Discussed literature review
    - Goal: obtain, read, and annotate (one paragraph or so?) relevant sources
    - The actual chapter two is not required at this time
  + Discussed CSCE 823 project
    - After tokenizing the CAN bus data, can ML effectively cluster the signals?
      * We can verify (visually) by plotting the time series in each cluster
    - Need to identify the J1979 queries within the dataset
* Met with Dr. Borghetti
  + Discussed CSCE 823 project
    - Signal clustering (discussed with Dr. Graham)
      * Concern: are they all continuous time series, or is it possible that they’re discrete?
      * Discrete signals don’t bode well for ML
    - One-shot learning
      * Can ML identify whether two signals are the same/different?
      * If we define “same” loosely, this could be a different clustering technique
    - Active learning
      * Can ML label every signal in the dataset?
        + J1979 can label some signals
        + Model asks the expert to label the hardest examples
        + Is this useful?

Active learning requires 1+ labeled example for every desired class

An ability to label at least one observation from each class means we might not need ML for this…

* Completed LEAP application and sent endorsement forms to Dr. Graham and to Maj Tseng
  + Still need to take the language test (DLPT) on 10 July
  + At that point, entire application is ready for submission