Lt David Crow

Activity Report 2

4 April 2019 – 27 April 2019

Week 1

* Met with Dr. Graham
* CSCE 623 project: machine learning to model dynamical systems
  + Look for speed control data
* Research project: EDM as an intrusion detection system
* Found several resources concerning machine learning and controls
  + It’s an entire field
    - <https://en.wikipedia.org/wiki/Machine_learning_control>
    - <https://www.quora.com/How-do-I-fuse-machine-learning-and-control-theory>
  + Byron Boots researches it
    - <https://www.cc.gatech.edu/~bboots3/>
    - <https://www.cc.gatech.edu/~lsong/teaching/CSE6740fall14/BBoots.pdf>
  + Steve Brunton has a bunch of relevant YouTube videos
    - <https://www.youtube.com/channel/UCm5mt-A4w61lknZ9lCsZtBw/playlists>

Week 2

* Very busy with coursework
* Began consuming resources found in Week 3

Week 3

* Met with Dr. Borghetti about CSCE 623 project
  + Considered applying ML to intrusion detection database
    - He said there wouldn’t be many insights to gain from said database
  + Asked about generating speed control database
    - He said we should aim to generate this database with real CAN bus hardware
    - Dr. Graham said we might be able to get the ABAS simulator working
      * We have the source code from AFRL
      * Would require a nontrivial amount of time/effort
  + Considering a fingerprinting/activity-classifying project
    - Would need to generate database, but this isn’t difficult
    - Applications?
* Met with Dr. Graham about CSCE 623 and 686 projects, research concerns
  + CSCE 623 project
    - See previous bullets
  + CSCE 686 project
    - Discussed a few difficult problems, but none seem incredibly feasible for the class
    - For example, airplanes as a mobile, non-stationary network
  + Research concerns
    - Not exactly sure what my end goal is/should be
      * Focus on building a foundation
    - Not a lot of time to give to research
      * Focus on coursework
      * However, I am going to devote more time each week to research
        + Increasing non-class, on-campus hours from 8 to 17 each week
    - Course of action going forward
      * Ensure I can follow Capt. Stone’s RE process (signals —> time-series plots) before he leaves
      * Set a literature review requirement for myself
        + Five articles per week — including one-paragraph summary/analysis of relevance
      * Going to look for a relevant conference
        + Goal to work toward