

Nationwide: Telematics Assessment Exercises

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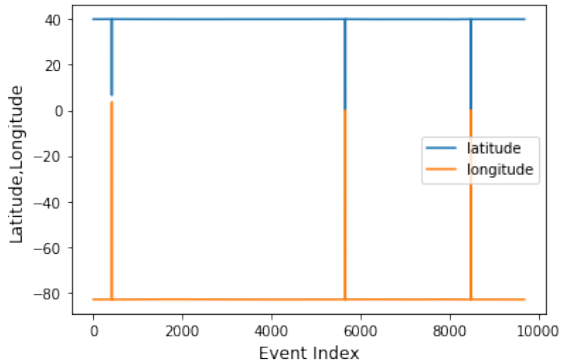
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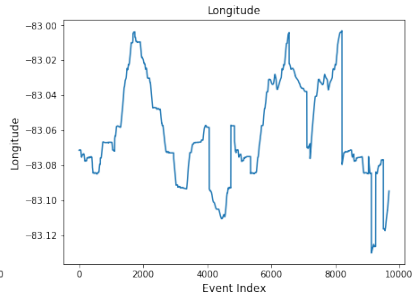
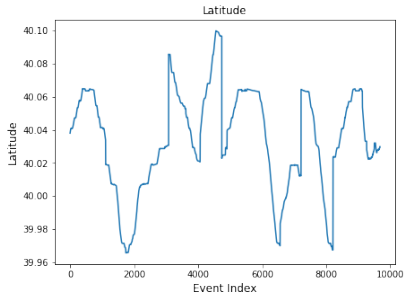
Part 1: GPS Data

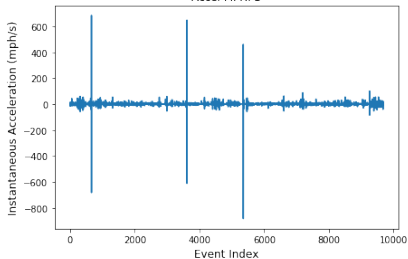
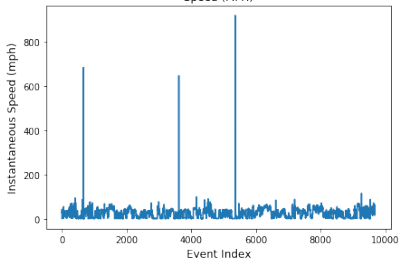
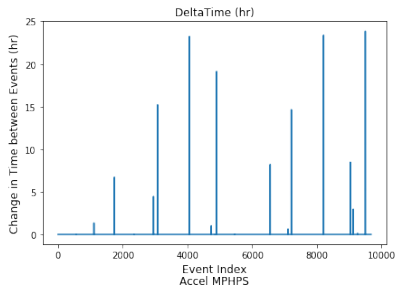
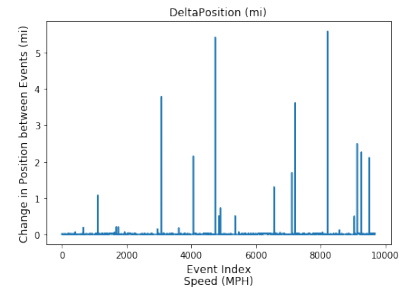
Part 2: Modeling

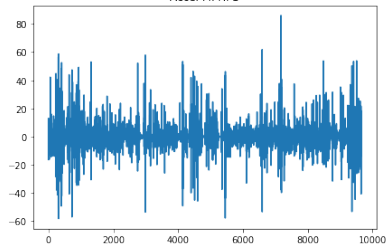
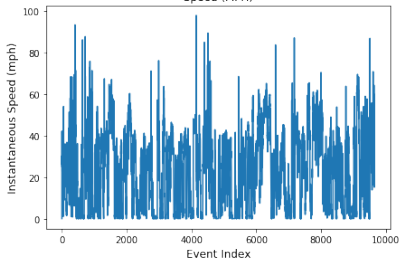
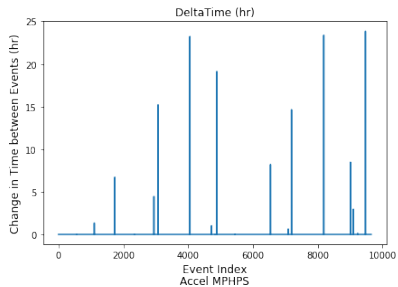
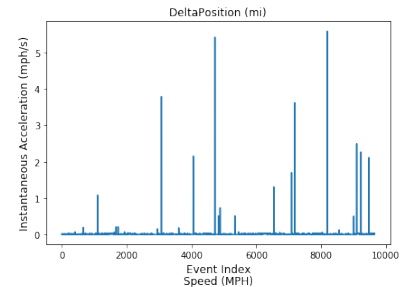
Conclusion

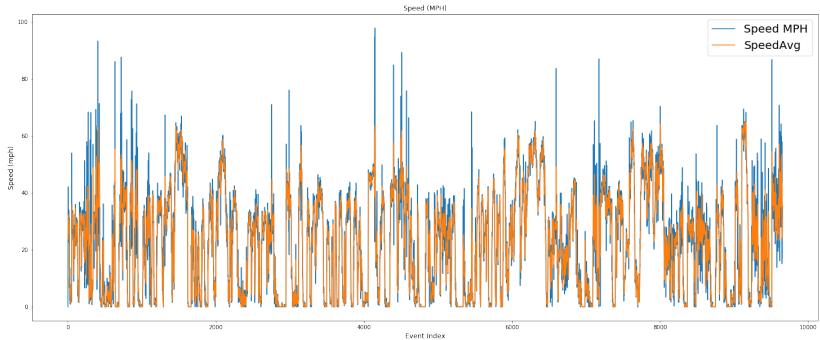


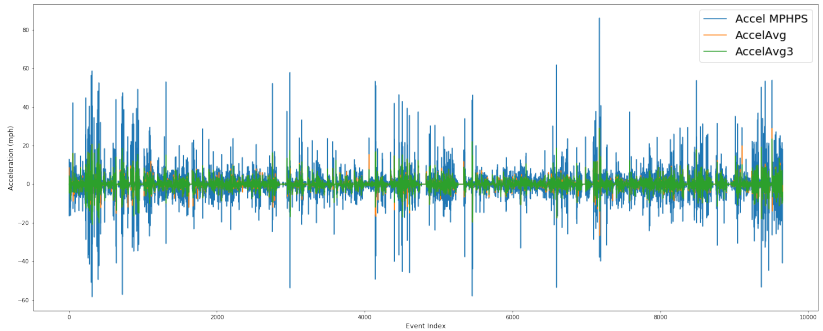


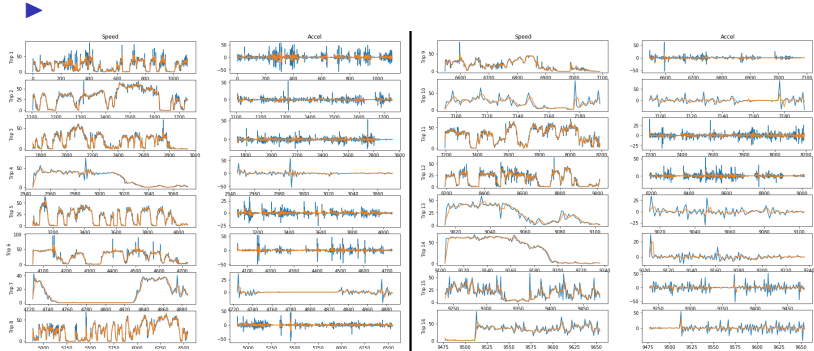


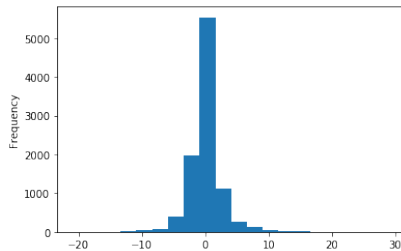














Trip: 1
Hard Accel Events: 47
Hard Brake Events: 40
Idle Time: 3.05 min, Total Time: 22.25 min
Distance Traveled: 6.83 mi

Trip: 2
Hard Accel Events: 7
Hard Brake Events: 5
Idle Time: 1.15 min, Total Time: 13.03 min
Distance Traveled: 7.29 mi

Trip: 3
Hard Accel Events: 10
Hard Brake Events: 11
Idle Time: 3.45 min, Total Time: 24.45 min
Distance Traveled: 7.77 mi

Trip: 4
Hard Accel Events: 3
Hard Brake Events: 1
Idle Time: 0.23 min, Total Time: 2.33 min
Distance Traveled: 1.06 mi

Trip: 5
Hard Accel Events: 10
Hard Brake Events: 5
Idle Time: 3.07 min, Total Time: 18.70 min
Distance Traveled: 9.75 mi

Trip: 6
Hard Accel Events: 18
Hard Brake Events: 10
Idle Time: 0.90 min, Total Time: 12.60 min
Distance Traveled: 7.83 mi

Trip: 7
Hard Accel Events: 3
Hard Brake Events: 1
Idle Time: 1.48 min, Total Time: 4.03 min
Distance Traveled: 6.55 mi

Trip: 8
Hard Accel Events: 11
Hard Brake Events: 13
Idle Time: 4.22 min, Total Time: 33.73 min
Distance Traveled: 14.31 mi

Trip: 9
Hard Accel Events: 4
Hard Brake Events: 7
Idle Time: 1.60 min, Total Time: 10.97 min
Distance Traveled: 4.28 mi

Trip: 10
Hard Accel Events: 8
Hard Brake Events: 9
Idle Time: 0.02 min, Total Time: 1.93 min
Distance Traveled: 2.34 mi

Trip: 11
Hard Accel Events: 11
Hard Brake Events: 11
Idle Time: 0.62 min, Total Time: 19.20 min
Distance Traveled: 13.82 mi

Trip: 12
Hard Accel Events: 12
Hard Brake Events: 14
Idle Time: 2.90 min, Total Time: 16.15 min
Distance Traveled: 10.06 mi

Trip: 13
Hard Accel Events: 3
Hard Brake Events: 3
No Idle Time for this Trip
Idle Time: 0.00 min, Total Time: 1.65 min
Distance Traveled: 1.13 mi

Trip: 14
Hard Accel Events: 1
Hard Brake Events: 0
Idle Time: 0.15 min, Total Time: 2.48 min
Distance Traveled: 4.04 mi

Trip: 15
Hard Accel Events: 17
Hard Brake Events: 13
No Idle Time for this Trip
Idle Time: 0.00 min, Total Time: 4.47 min
Distance Traveled: 3.69 mi

Trip: 16
Hard Accel Events: 7
Hard Brake Events: 10
Idle Time: 0.32 min, Total Time: 3.37 min
Distance Traveled: 3.80 mi

FCNC: What are we looking for? $t\bar{t} \rightarrow W(\rightarrow l\nu)b + q\gamma$

- ▶ Final state topology
 - ▶ One Neutrino, from W
 - ▶ One Lepton, from W
 - ▶ One B-jet, SM top
 - ▶ **One Photon, FCNC Top**
 - ▶ One Jet, FCNC Top

Background Processes

- ▶ Due to all of the processes at hadron colliders it is important to model similar event topologies well.
- ▶ Major backgrounds include $t\bar{t}$, W +Jets, Z +Jets, + processes with an associated photon

Monte Carlo Generation

- ▶ All of our MC data is put through a showering algorithm for propagation from final decay states
- ▶ Various showering algorithms are used at ATLAS - Pythia, Herwig, etc.
- ▶ All of these will add radiative photons
- ▶ These events can be contained in other samples with explicit photons originating from the hard interaction
- ▶ Need to remove these events or risk double counting events



Object Preselection

- ▶ We preselect events with objects that look like our expected topology
- ▶ Reminder that I require:
 - ▶ Exactly one lepton (e or μ) ≥ 28 GeV
 - ▶ Exactly one Good photon ≥ 25 GeV
 - ▶ Missing Transverse Energy ≥ 30 GeV
 - ▶ ≥ 2 Jets (at least one being b-tagged)
- ▶ All following plots will have signal scaled to 0.2% of nonallhadronic $\sigma_{t\bar{t}}$, MC scaled to 36.07 fb^{-1}
- ▶ Only electron channel shown. Similar results for the muon channel are seen.

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Conclusion, Outlook

- ▶ Orthogonal validation/control regions are in development
- ▶ Data grid run complete, need to incorporate into CR/VR plots
- ▶ Next grid run will include a couple of looser regions for CR/VRs
 - ▶ 0 Photon Samples for Backgrounds with no Real Photons
 - ▶ 0 BJet Samples - possibly for WJets region
- ▶ Top Group - Pushing for MVA, want to start investigations using these techniques

Backup