


ACPE Pedal Application Tests

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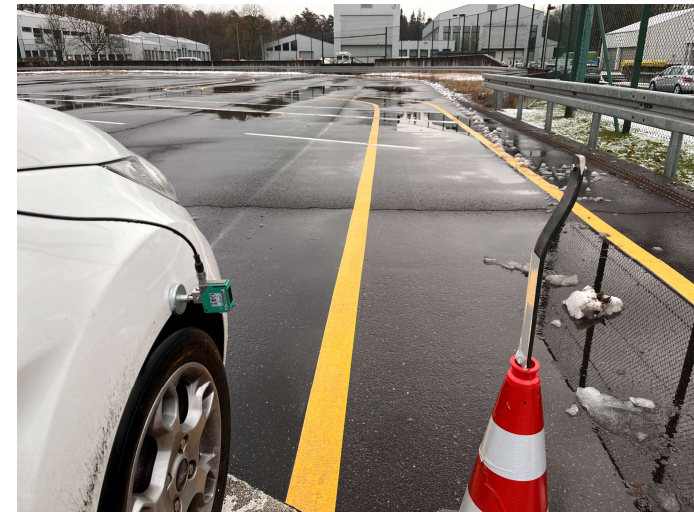
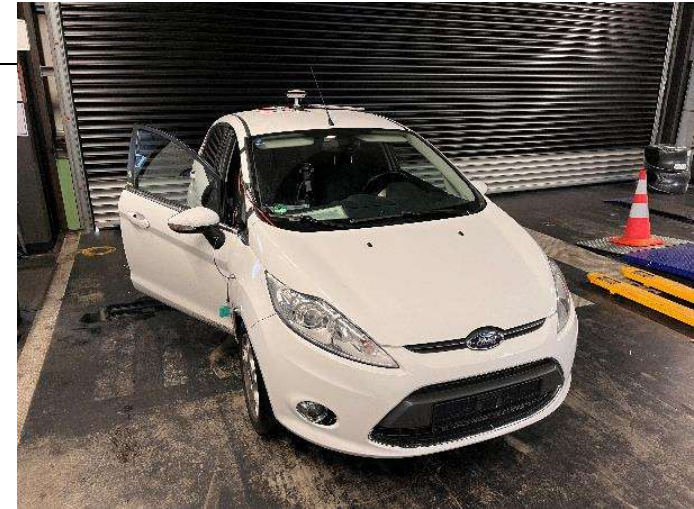


Motivation, Concept and Questions

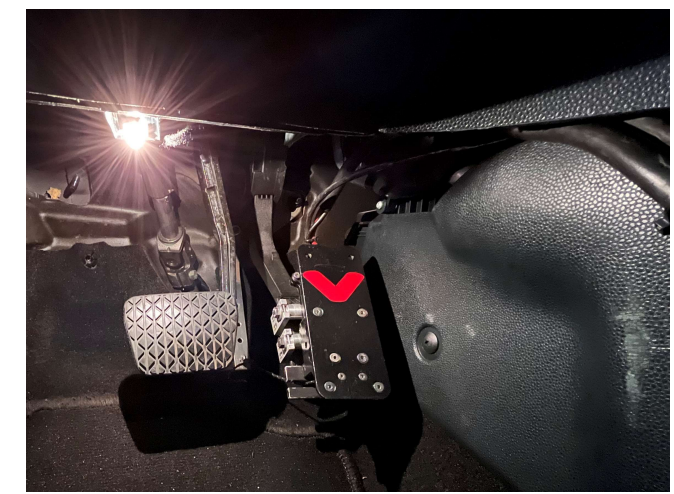
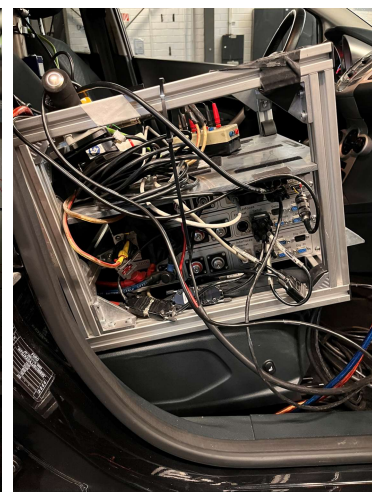
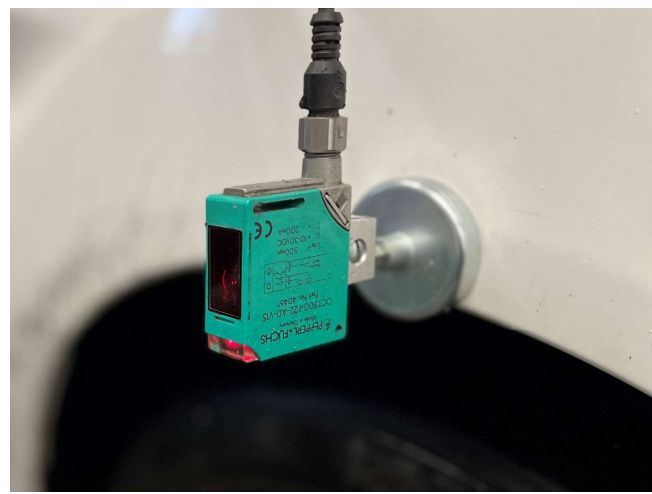
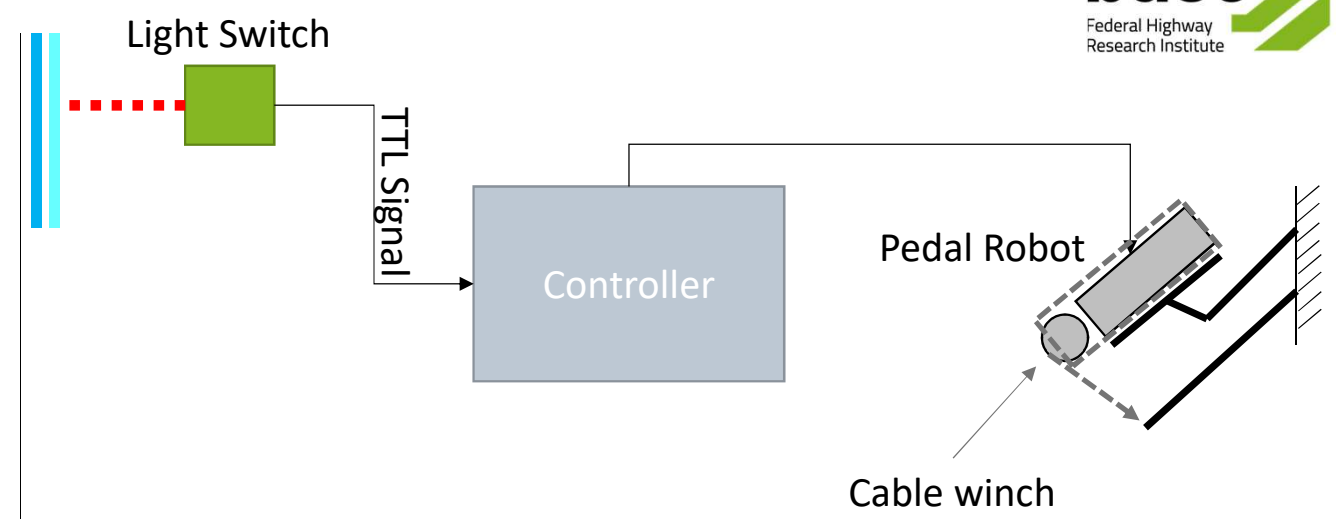
- ▶ ACPE04 had some discussions on how the “creep” method can be tested
 - ▶ “Creep” Method: vehicle creeps while “pedal misapplication” is applied (as opposed to: vehicle is initially stationary with the brakes applied)
 - ▶ Concept: AT vehicle was equipped with an accelerator robot that applies 400%/s accelerator speed when passing by a light switch reflector
 - ▶ Question: What are the delays? What are the resulting speeds at the “hypothetical” target?
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Vehicle and Equipment

- ▶ Older Ford Fiesta, automatic transmission
- ▶ Vehi.co CG300 accelerator robot
- ▶ Pepperl&Fuchs reflection light switch with TTL output, directly fed to the accelerator robot
- ▶ GeneSys ADMA-G for speed & position measurement, fed by CAN bus to the accelerator robot
- ▶ Data logging by accelerator robot



Robot System



Robot Programs & Demonstration

- ▶ Robot programmed with simple scripting language

```
PosZero
PosWaitDigiTrig(0, 0) ← When activated, TTL drops to 0
PosMoveTo(18.49, 100) ← Final position: 100%
PosHold(1)
PosZero
End
```

Pedal travel = 4.623 cm, 400%/s = 18.49 cm/s

Name of selected command
(physical meaning of arguments [unit])

Simulate Replot Interpret



- Video is with >>> pedal speed! -



VEHI.CO

5.535

-0.340

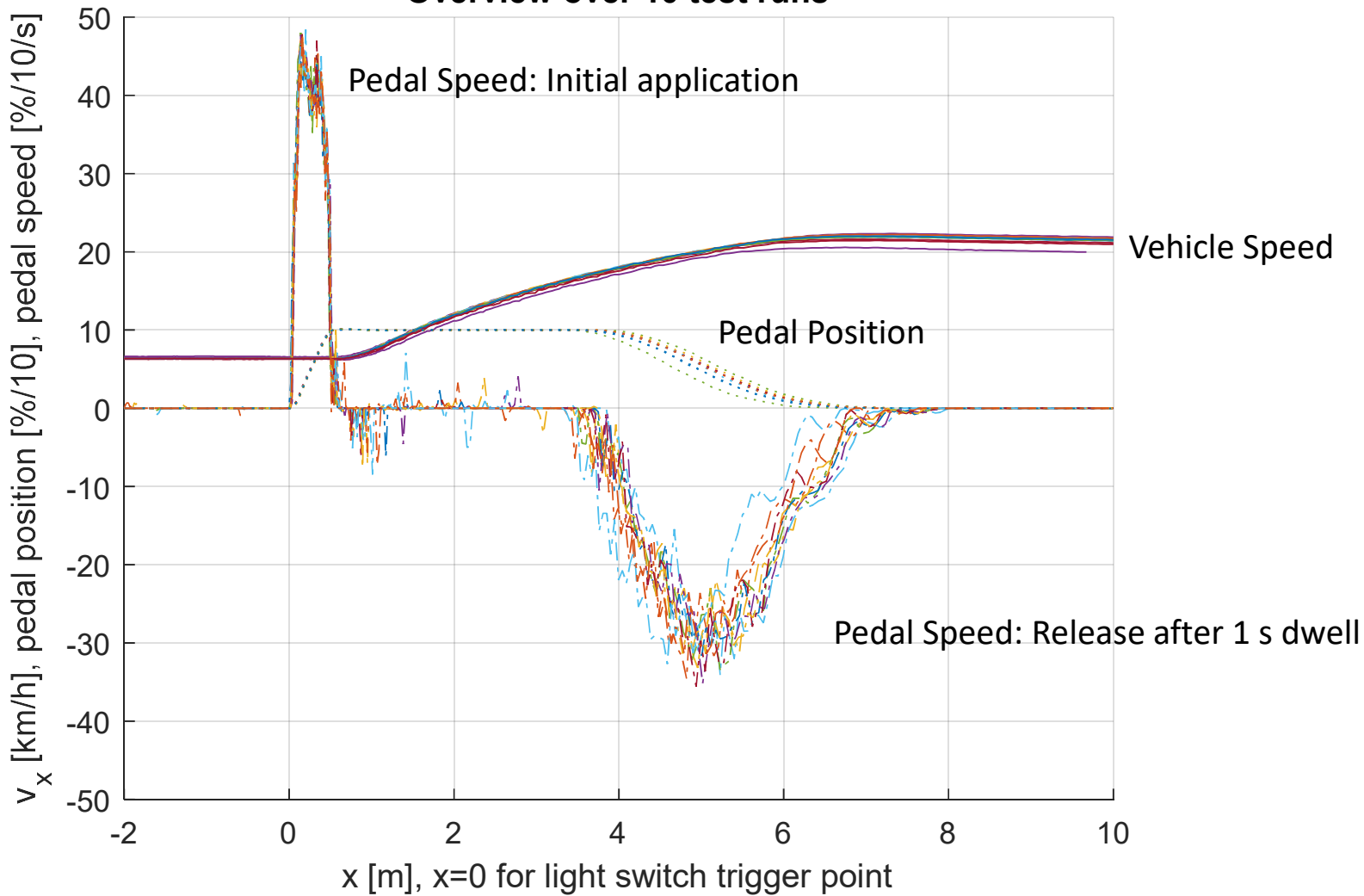
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11.020

Start

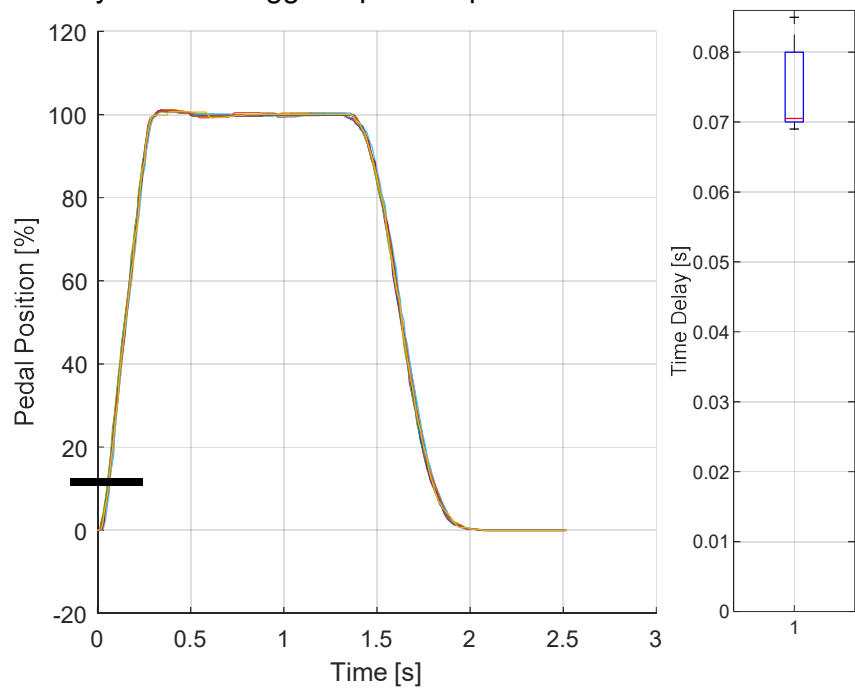
Stop

Overview over 10 test runs

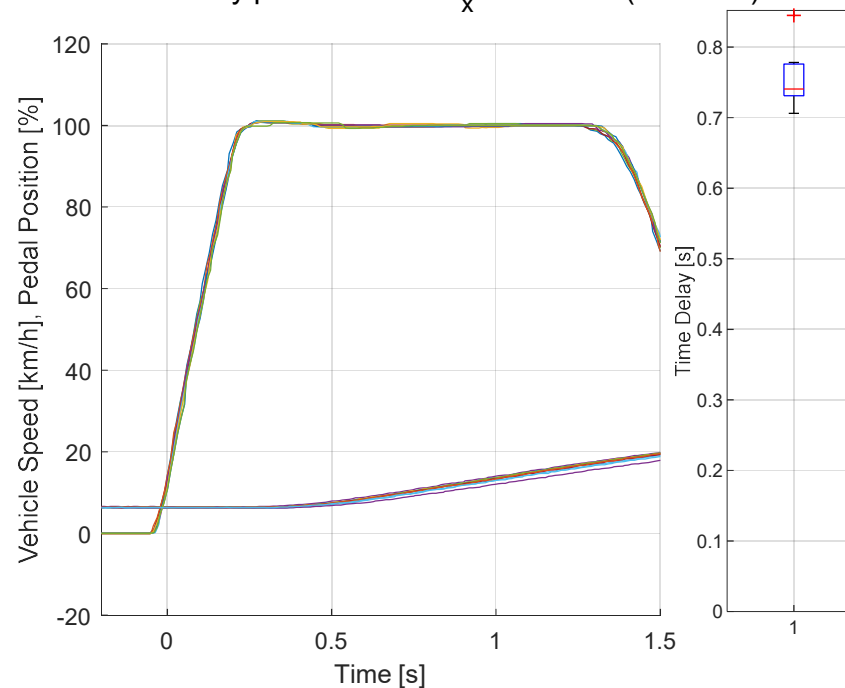


Delays

Delay between trigger input and position > 10% for the first time

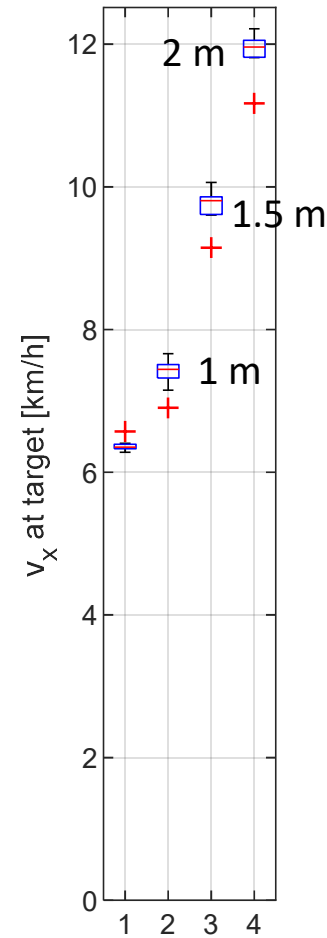
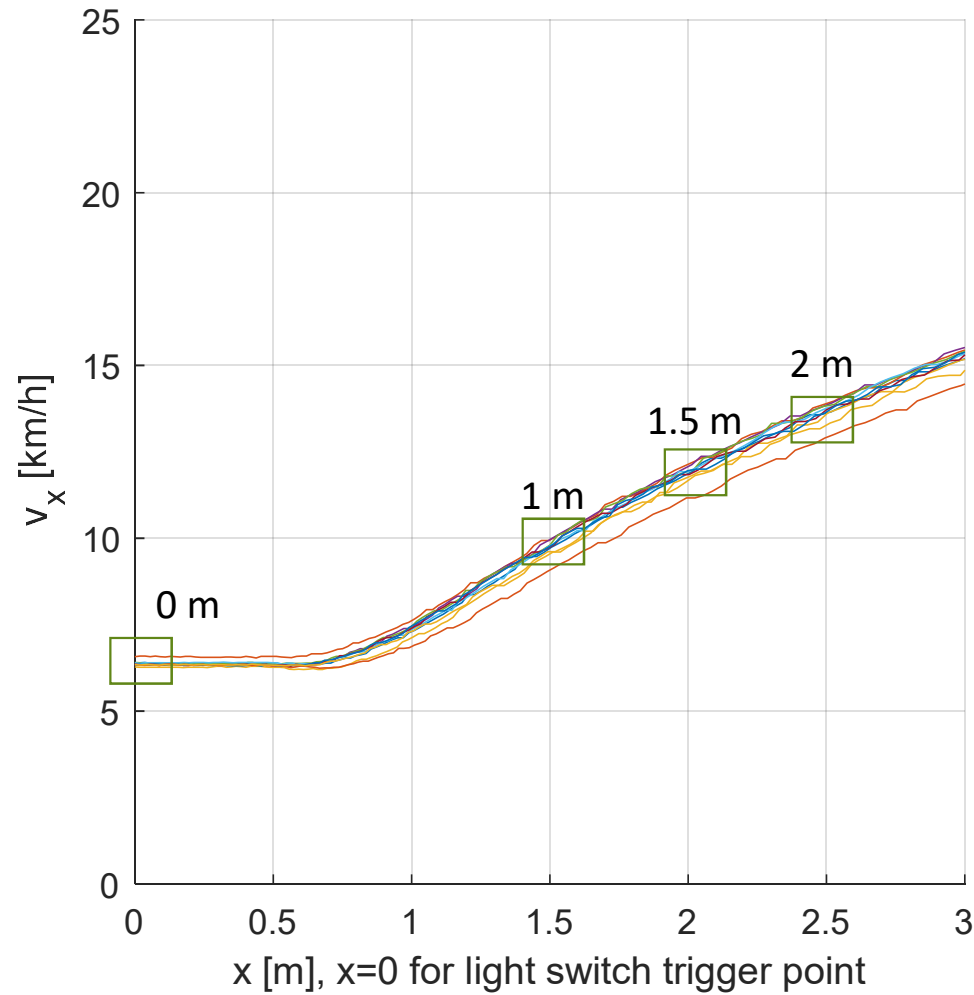


Delay pedal > 10% & $v_x > 10$ km/h (first time)



Speeds at Target

Vehicle Speeds at 0, 1, 1.5 and 2 m



Conclusion

- ▶ Pedal application with light switch-triggered robot allows for precise control of the accelerator pedal
 - ▶ The example vehicle creeps at approx. 6.5 km/h
 - ▶ The example vehicle has a delay of approx. 1 second for crossing 10 km/h after initial pedal application
 - ▶ With the planned pedal application profile, the speed after 1.5 m is just below 10 km/h
 - ▶ Other vehicles still need to be investigated
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