PREDICTING DRIVER STRESS WITH CONNECTED VEHICLE DRIVING DATA

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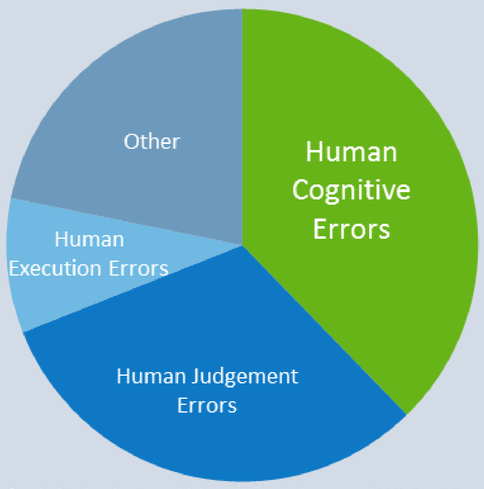
Motivation

Driver stress or cognitive overload is a **major risk** factor in **around 38% of traffic accidents**[1]

Measuring driver stress in real time is the **necessary first step** in order to **take counter-measures** like a stress-dependent adaption of the car interior or its driver assistance system



1 & Graph: "National motor vehicle crash causation survey" U.S. Dept. Transp., Washington, DC, USA, Tech. Rep. DOT HS 811 059, Jul. 2008

However, all current ways of stress detection rely on new additional sensors not present in todays car

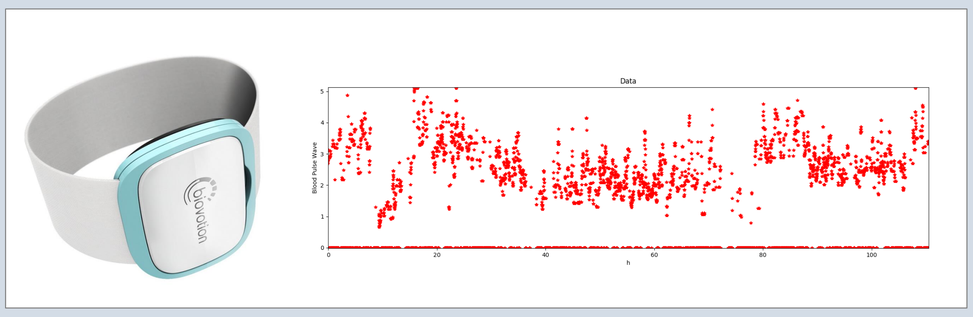
Can we identify Driver Stress with technology already present like…

RQ1) … Vehicle or Smartphone data?

RQ2) … environment data (GPS and time)?

Physiological Data

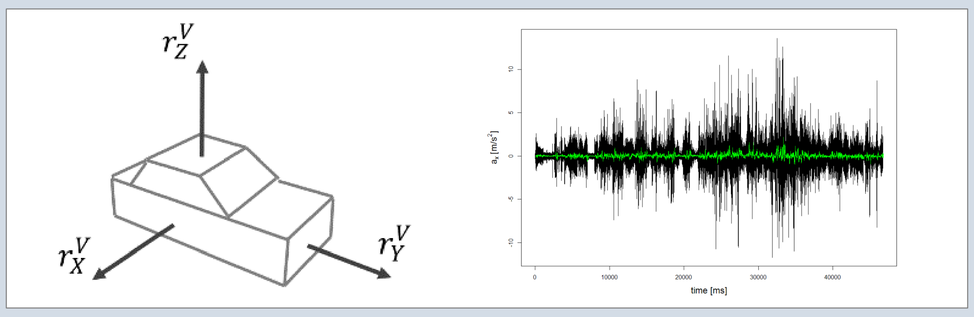
Physiological data collected with a medical wearable (Biovotion Everion) as ground truth



- Measuring Heart Rate Variability (HRV) and Galvanic Skin Conductance (GSR) at 1 Hz
- Collected over 5'000h of data over 3 months

Vehicle Data

Vehicle data collected via OBD-II for stress prediction, including access to some CAN data



- Recording a number of signals at 60 Hz, including steering wheel angle, break and gas pedal position, and acceleration data
- Collected data from 40 drivers over 3 months

Stress Detection Model

Future Work

- Analysis of completed field test, which ran over 3 months with 40 vehicles participating and more than 5'000 h physiological data gathered
- Comparison of accuracy of different car signals via stepwise feature selection

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