Tools for data gathering in different FOTS

Independent logging platform for NDS pilot study (funded by BASt)

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Motivation

• Driving observation in real traffic scenarios
• Research on normal driving behaviour and critical situations and accidents

Challenges

• Easy installation and removal of Data Acquisition System (DAS)
• Universal application in different vehicles
• Management of extensive amount of data

• Need for different tools to support the data acquisition, data management and data analysis
Data process chain
Data Acquisition System - overview

- Lane properties, lateral deviation
- Distance to objects, relative velocity
- Accelerations
- Yaw rate
- ESP - IMU
- GPS
- DLR ECU
- bus simulation
- private sensor CAN
- Status LED
- Data Logger
- 128 GB
- 1,5 GB/h
- Cameras, 25 fps
- opt. OBD
- GPS
- LDW
- ACC
Driver activity

Driver gaze

Rear

Front
Data Acquisition System - Mounting

LDW camera

ACC radar
Data Acquisition System - Mounting

ESP (IMU)

Logging unit (trunk)

Driver activity cam
Data import process

- Transformation of recorded raw data in experiment database
  - Pre-processing of raw data
  - Extraction of sensor data (private Sensor CAN messages)
  - Matching with DBC definitions
  - Transformation to specific data format
  - Conversion of video files
- Graphical layout of import tool
- Java/Eclipse based
Data management tool
Conclusion

• Successful NDS data infrastructure established
  • With fleet management
  • Tools for data management and inspection
• Effective implementation on existing experiment based workflow
• Vehicle independet DAS solution
• Secure server infrastructure for remote analysis access
Lessons learned

- Data synchronisation issue with separated video recording
  → New logging system: Synchronised data record of videos and other driving data
- Original data storage of 32 GB not enough
  → 128 GB to minimise contact to subjects
- Remote Video annotation site during data analysis should have a local copy of video files
- Status LED to check system integrity to recognise sensor failures in time
Thank you for your attention!

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