UDRIVE

European Naturalistic Driving Study

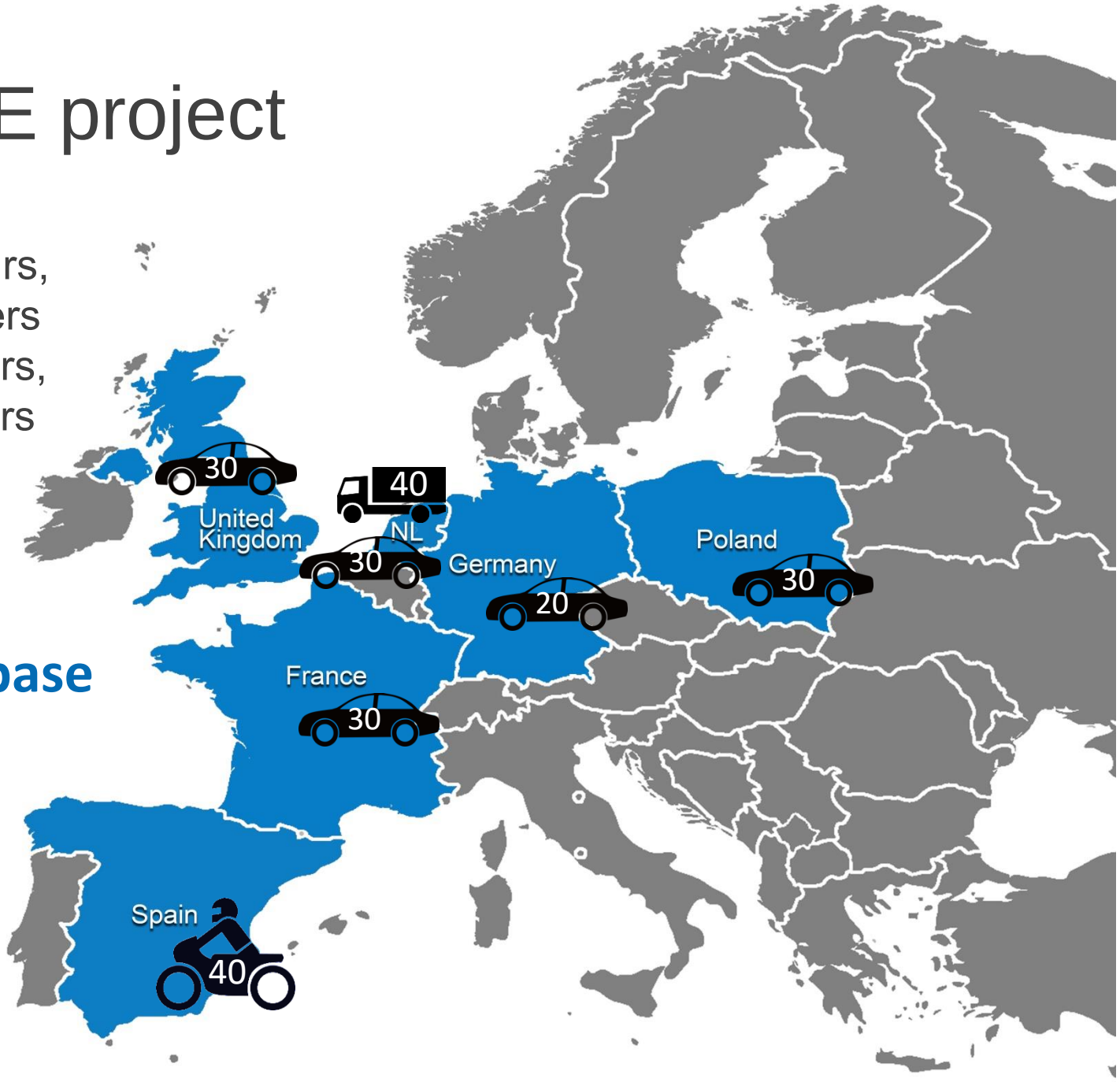
Data description and analysis plan

UDRIVE project

Data collected:
car: 13 200 hours,
125 drivers
truck: 6 000 hours,
41 drivers

One DAS

One Database



Vehicle types

3 cars types:

- Renault Clio 3 (small car)
- Renault Clio 4 (small car)
- Renault Mégane 3 (Medium-sized family car)

1 PTW type: Piaggio Liberty

2 Truck types: Volvo, medium sized for city deliveries

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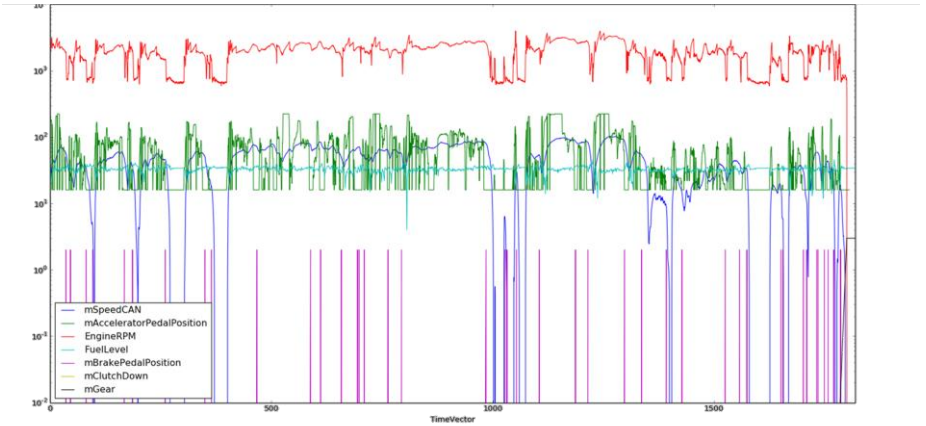
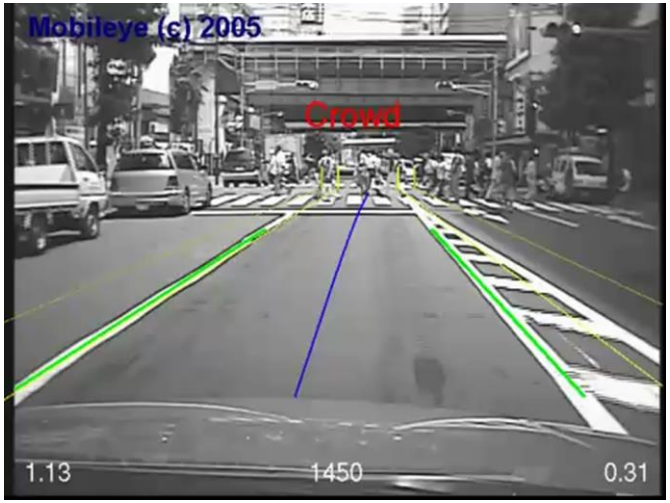


- CAN signals
  - Velocity
  - RPM
  - …
- Mobile Eye
  - Surrounding objects position and velocity
- Video
- MAP matching
  - Speed limit
  - Road type
  - Intersection type
- Derived signals from users
  - Derived road type
  - Derived headway



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Data description

- Natural behaviour in natural surroundings
- Using continuous signals instead of Safety-Critical-Events
- Not all variables are well-documented and available
  - road inclination, lane width
- Some variables can be derived from other signals
  - headway, braking energy, curvature, gear, road type

Eco-driving in UDRIVE

- Infrastructure and congestion will have largest influence on fuel consumption
- Only the bandwidth of personal style is the bandwidth of eco-driving
- Decouple the reasons for good/bad eco-driving behaviour:
  - personal style
  - congestion/other road-users
  - road infrastructure
  - vehicle type

Research questions

- RQN5.4: When do drivers brake and is it necessary to brake in each instance?
  - recognizing bends, junctions, traffic lights (map data and accelerometer)
  - headway, lane width (mobile eye), road gradient
  - brake pedal signal (from CAN), braking energy, gear, engine speed
- RQN5.2a: How much do drivers deviate from the speed limit in free flow situations?
  - velocity and acceleration
  - lateral acceleration, bends
  - junctions, traffic lights, speed limits
- RQN5.2b: Why do drivers deviate from the speed limit in free flow situations?
  - speed limits (map data)
  - headway distance (mobile eye)
- RQN5.6: Do drivers shift gear to avoid high engine speeds and high fuel consumption?
  - engine speed, gear position, clutch engaged signals (CAN)
  - acceleration (accelerometer)
- RQN5.5: Is eco-driving an observable characteristic of certain drivers?
  - Ecodriver parameter, driverID and characteristics (questionnaire)
- RQN5.3: Is eco-driving and safe driving correlated, through increased anticipation of road infrastructure and traffic situations?
  - SCE information from other WPs, ecodriver parameter

Analysis plan

- Study parameters related to research questions
- Decouple driving conditions and personal driving style
- Determine average driving style, and residual per driver
- Cluster drivers by common characteristics and driving style
- Define ‘eco-driving score’ based on driving style parameters
- Evaluate potential of eco-driving from differences between driver groups and corresponding fuel consumption

Analysis plan

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Q&A

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