National Technical University of Athens
Road Safety Observatory

Online workshop in the framework of 6TH UN GLOBAL ROAD SAFETY WEEK
17 - 23 May 2021
Streets for Life
#Love30
DECADE OF ACTION FOR ROAD SAFETY 2021 - 2030
30 KM/H
Thursday 20 May 2021
Innovation in Road Safety Research

# Driver-vehicle-environment interactions and the safety tolerance zone


## Christos Katrakazas

Transportation Engineer, Research Associate

Together with:
Eva Michelaraki and George Yannis


iDREAMS

# The i-DREAMS project

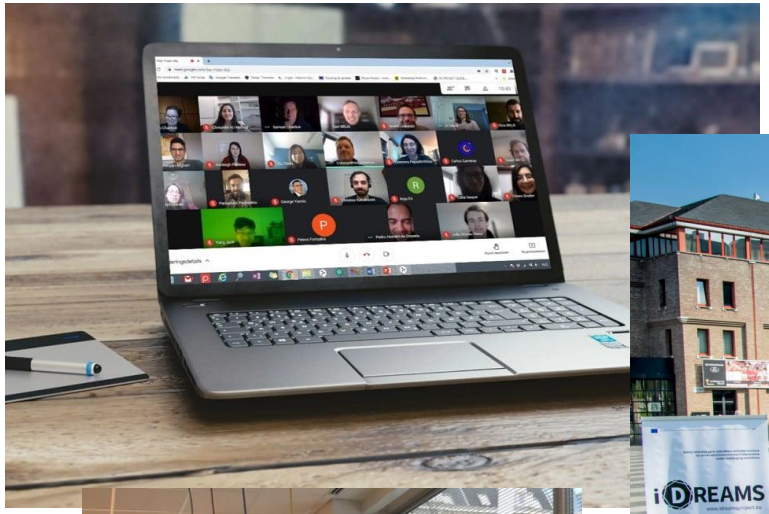
- **13 Project partners**:
  - National Technical University of Athens

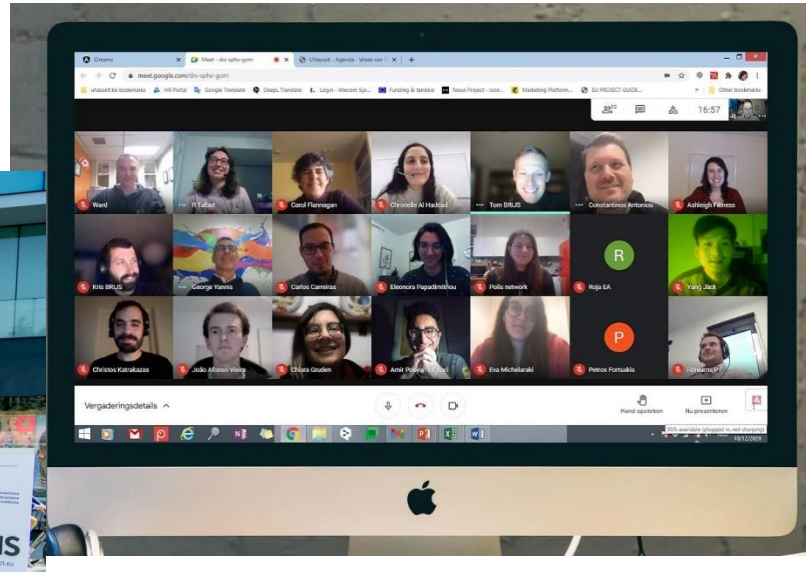
    Universiteit Hasselt, Loughborough University, Technische Universität München, Kuratorium für Verkehrssicherheit, Delft University of Technology, University of Maribor, OSeven Telematics, DriveSimSolutions, CardioID Technologies, European Transport Safety Council, POLIS Network, Barraqueiro Transportes S.A.

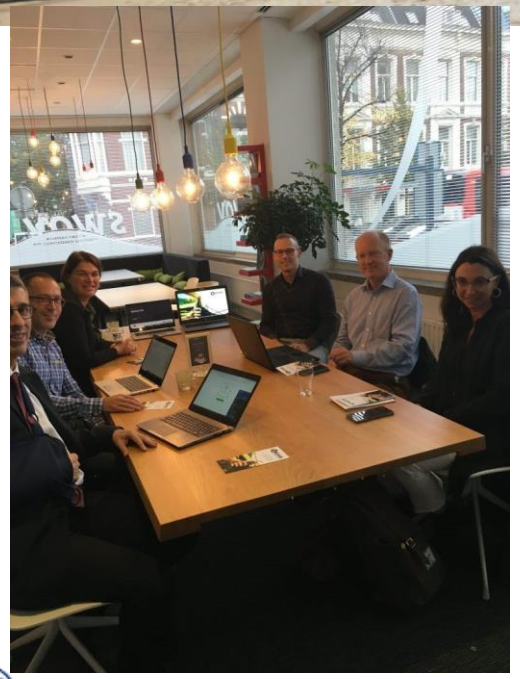
- **Duration of the project**:
  - 36 months (May 2019 – May 2022)

- **Framework Program**:
  - Horizon 2020 - The EU Union Framework Programme for Research and Innovation - Mobility for Growth

# The i-DREAMS great team





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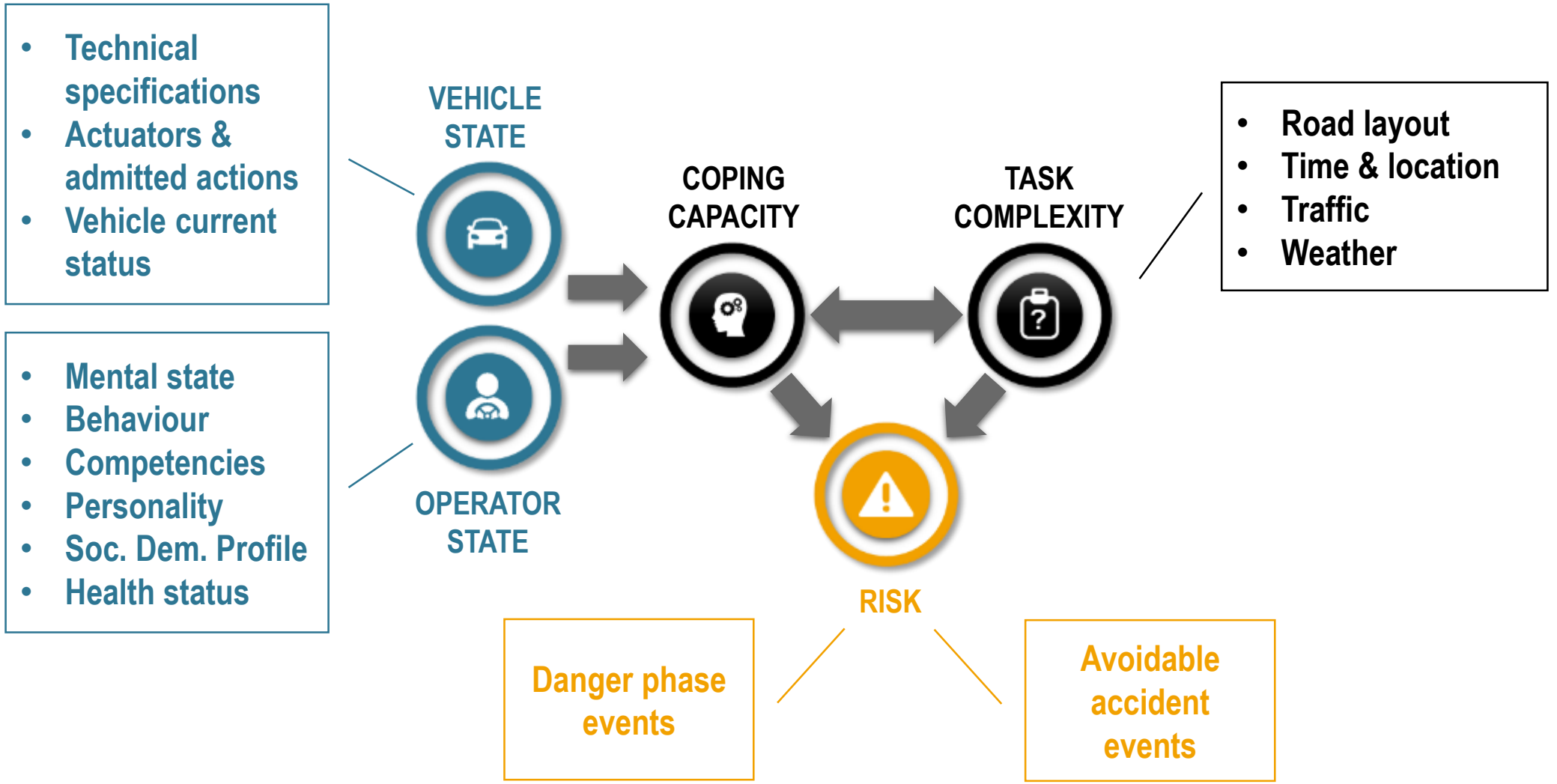
# Background

- Definition, development, testing and validation of a context-aware **'Safety Tolerance Zone'**:
  - raw **time-series** sensor data and driver background data are transformed into **indicators**
  - **operator capacity and task complexity** variables are used for a multi-dimensional assessment of driving context and crash risk prediction
  - appropriate driver comfort related interventions take place in **real-time** to recall driver back into a safe area if needed and guidance is given **post-trip** to improve driving behavior

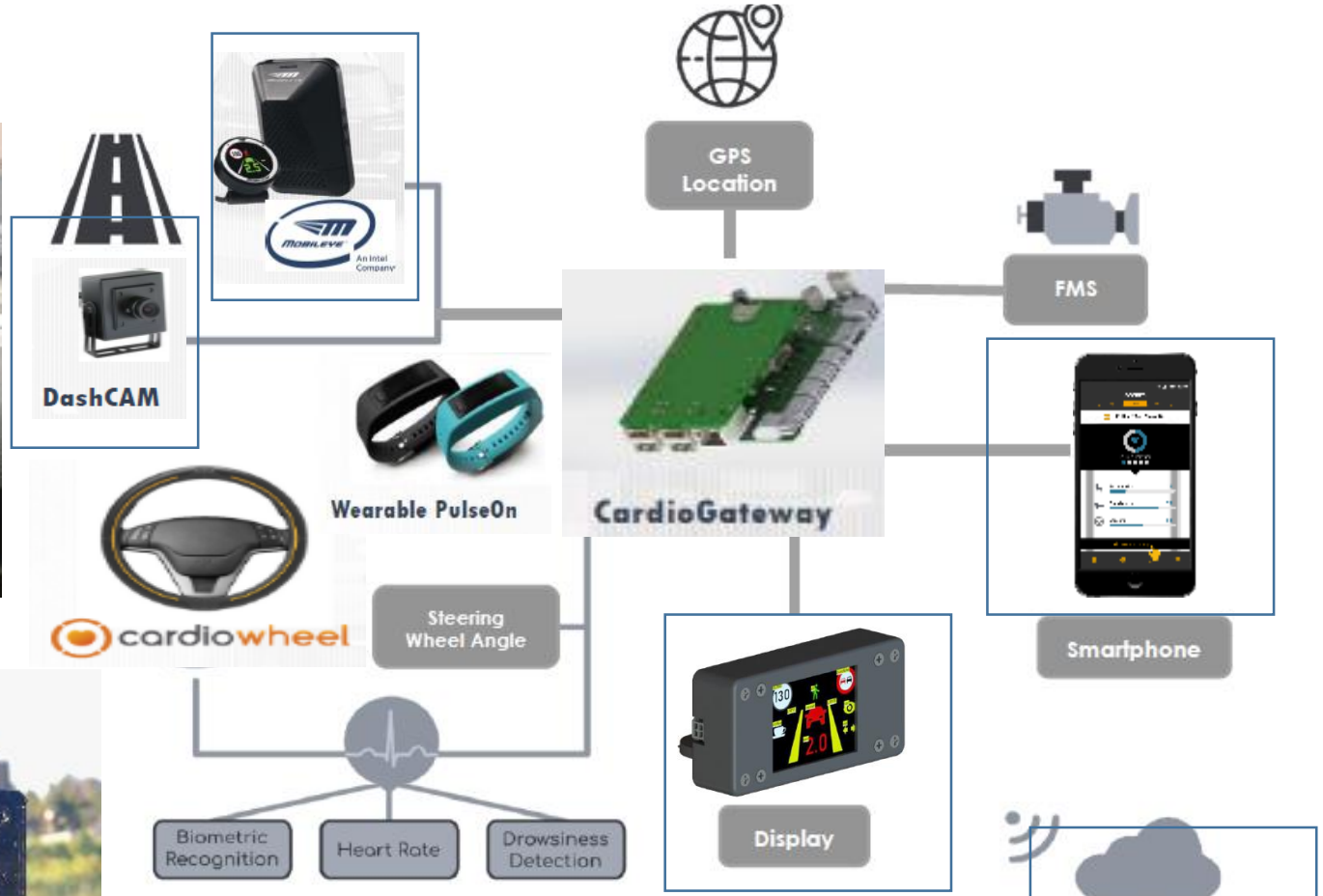
# Concept Overview



# The i-DREAMS Experiment

- **A 600-operator experiment**
  - 10 months
  - 5 countries (BE, EL, DE, UK, PT)
  - 4 transport modes (car, bus, truck, train)
- **Simulator**
  - 30 drivers, 8 weeks (in Greece)
  - test, calibrate and further refine the accuracy of the Safety Tolerance Zone
- **Field trial**
  - 70 drivers (in Greece)
  - 3 stages (pilot field trial, baseline field trial, field trial with interventions)
- **Intervention selection and testing**
  - real-time effectiveness on driving behavior (safety critical events, near misses etc.) and driver state
  - personalized in-vehicle interventions and post-trip feedback

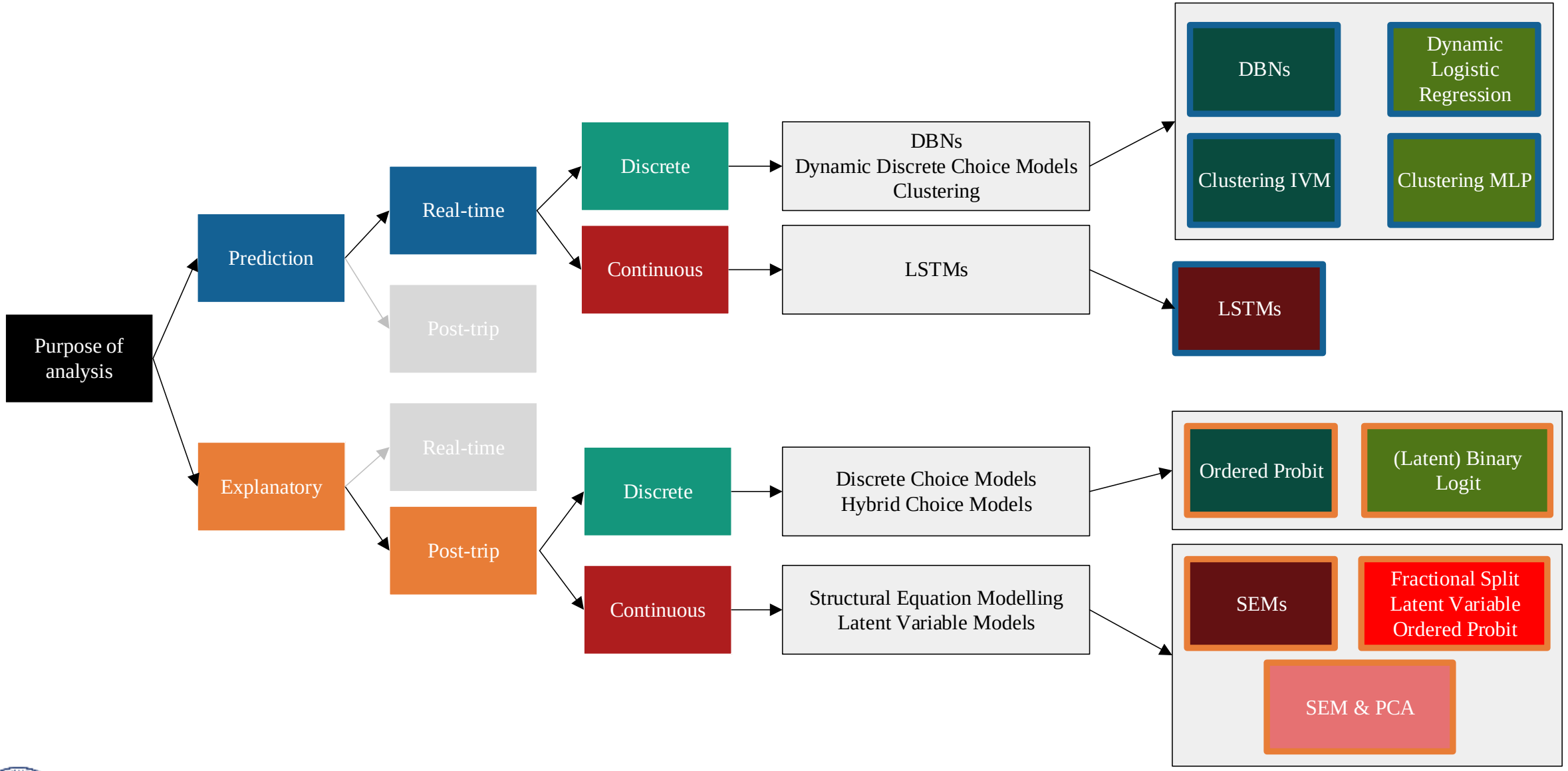

# Technical Equipment




video

Live demo

# Mapping Methodological Approaches



# Scientific and Social Impact

- **Enhanced road safety** for a diverse demographic by increasing consideration of human factors within designs and transport operation means
- Improved operator's **driving performance and skills** through the close and interactive monitoring and assessment of their driving behavior
- Enhanced **international cooperation** concerning human factors in traffic safety
- Policy **recommendations for Authorities** on how to exploit the i-DREAMS platform to improve safety

# Future Challenges

- **Expansion of the Safety Tolerance Zone** to other modes and users (Powered Two Wheelers, Cyclists, Pedestrians)
- **Real-time investigation** of the significant risk factors (e.g. weather, distraction and impairment)
- Modification of Safety Tolerance Zone to ensure **safer automated vehicles**

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