

The joint framework for the SCCER Mobility Digitalization Projects

The joint framework for the SCCER Mobility Digitalization Projects has been specifically designed as a tool to monitor the development of the projects and identify and explore potential synergies. In particular, the framework has two main purposes: 1) To guide the bilateral discussions and to structure the all-together meetings between the L²-FTS and the academic digitalization partners. 2) To combine the multiple-purpose outputs of the projects and increase their outreach. Below, the

framework is described and illustrated with a few selected outcomes. The timeline below explains the use of the framework as an overarching activity of the Digitalization Program. The regular information exchange through multiple meetings, templates and the joint activities have strengthened the SCCER network, and encouraged knowledge transport among the participants, and supported the groups to further investigate the different research topics.

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Learning Lab Future Transport Systems (L²-FTS)
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With the collaboration of the academic digitalization project partners below:

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IKG - ETH Zürich. Martin Raubal, Dominik Bucher, Yanan Xin, Henry Martin & Ye Hong.

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Digitalization Projects



Smart Mobility Data Platform

P. Affolter & A. Laube



AD Sensor Testing Vehicle

C. Bach & E. Frazzoli



DSS for Personalized Ride-Sharing Services

M. Raubal



EV on Grid stability

M. Raubal, R. Rudel & L. M. Gambardella

Check project posters for information on the individual projects

Digitalization Joint Framework

Common Elements

Block I

1. Creation of an open dataset
2. Definition of decision making problems
3. Description of the main solving approaches
4. Homogeneous scenario generation

Block II

1. The Value of data
2. Sensitivity
3. Cross-comparison
4. Prototype Output
5. Result consolidation for Digitalization
6. Contribution to SCCER-M Goals

Identified Links

Block III

- Data
1. Collection, Storage and Management
 2. Privacy
 3. Filtering, fusion, or generation

Block IV

1. Autonomous, Electric and Shared Mobility
2. Real-world Pilots, or Simulations
3. Travel Pattern or Trajectory prediction

Framework – Block I

1. Smart Mobility Data Platform and Autonomous Driving Sensor Testing vehicle projects will both generate an open data set at the end of the project.
- 2&3. Decision making problems & Solving approaches are varied and belong to multiple research fields. However, the discussion through the multiple meetings has enhanced the way the projects present their outputs for a broader scope audience.
4. The following scenarios (within the projects which are relevant) will be analyzed:
 - o Geographical/population scope.
 - o Time scale.
 - o Parameters: Environmental, weather, aging conditions

Framework – Block II

1. Data has been the essential element that has driven the projects to explore new features. Without it, the projects would have simply not existed. Furthermore, the decisions made with them have proven to adapt well to the challenges.
2. All projects could be expected to increase their positive impact if scope would be extended either geographical or population.
- 3&4. Projects have been able to use multiple sources of data and generate one or more prototype outputs. In all cases, these will remain as an essential tool within the research group, and evolve further.
5. Only preliminary results are available at the moment.
6. At the moment, only a qualitative contribution of the projects to SCCER-M Goals can be evaluated, which are positive in all the projects.

Expected Impact

It is not straightforward how to steer the future digitalization developments towards a more energy efficient system. However, the 4 digitalization projects have made individually contributions, some of them mentioned below:

- o Smart Mobility Data Platform developed a powerful tool to monitor batteries in mobility applications, this should enable multiple studies to electrify fleets.
- o AD Sensor Testing, the vehicle with all the sensors and small test track is a powerful tool to allow this research line to continue.
- o DSS for Personalized Ridesharing Services. Multiple contributions to magnify the beneficial effects of ridesharing, specially in the short-distance real-time
- o EV on Grid Stability. Combination of latest research from three research groups and respective fields to obtain evaluate combined impact.

Timeline



Partners