Lernende Systeme

GERMANY'S PLATFORM FOR ARTIFICIAL INTELLIGENCE

On the Way to Intelligent Mobility

Report by the Working Group
Mobility and Intelligent Transport Systems

Executive Summary

A safer, more flexible and more economical way to get from A to B by road, rail or water – Artificial Intelligence (AI) can play an important part in achieving this vision. Indeed, AI-based assistance systems help make transport systems more intelligent and futureproof. This is made possible by the interplay of sensors, cameras and intelligent infrastructures and platforms that capture, manage and share traffic data. Increasingly sophisticated Machine Learning (ML) processes are being used to process captured data and derive operations to be executed either by people or by the systems themselves.

There is a whole range of challenges to be overcome before AI-based intermodal and multimodal networking can become a reality for traffic flows. First and foremost are the technical and scientific issues that arise when researching and developing AI-based technologies for the mobility sector. Similarly, solutions need to be found to ensure self-learning systems can be integrated – and can interact – across different modes of transport and common data platforms. At the same time, all AI-based mobility solutions should meet the requirements of both society and individuals and achieve social acceptance, which poses particular challenges when it comes to safety and ease of use. Last, but by no means least, legislators must adapt the legal regulations. All these aspects come into play, particularly during the transition period from conventional to fully automated mobility – a complex mixed traffic scenario comprising non-automated and automated vehicles, cyclists and pedestrians.

In this report, the working group Mobility and Intelligent Transport Systems of Plattform Lernende Systeme analyses the complexity associated with using AI-based systems in the mobility sector. To do that, it first defines the sphere of mobility – a system comprising an infrastructure and various modes of transport. This system is in a position to meet all the mobility needs of its users. It

is conceivable that AI could help optimise many elements within the sphere of mobility, including all modes of transport such as road, rail, aviation and waterways as well as traffic flow systems.

Representatives from science and industry have come together in the working group Mobility and Intelligent Transport Systems of Plattform Lernende Systeme to discuss the opportunities and challenges of self-learning systems for various modes of transport. For its first report, the group has identified five areas of action that scientists, businesses, politicians and wider society should engage with if they are to promote AI-based mobility and intelligent, sustainable and needs-based transport systems in a focused manner.

These areas of action are:

- Safety in intelligent transport systems
- Networking and interaction between systems
- Availability of transport fleets and infrastructures
- Human-machine interaction (HMI) in mobility
- Social aspects

In addressing all these areas of action, this report sets out potentials, challenges and essential prerequisites for developing and implementing self-learning AI-based systems in the sphere of mobility. Based on these, it derives measures that the research and development sector, businesses, politicians and wider society ought to pursue as they work towards intelligent mobility.

Using this analysis as a basis, the working group strongly recommends that an overarching mobility platform should be developed. The working group has a roadmap for the next three years, during this time experts are to develop an appropriate concept – at least in terms of its main features. The platform's aim is to bring together the offerings of various mobility service providers and data on transport and infrastructure. It is to organise this information, prepare it for the relevant target groups and make it available to heterogeneous user groups. Additional aspects such as sustainability and safety will also be addressed in more detail.

In parallel with this report, the working group developed an environmental scenario for the intelligent mobility of the future. Using an individual journey and a single logistics process as an example, the scenario depicts various applications that are being made possible by AI-based, intelligent and networked modes of transport and transport systems. The interactive graphic for this scenario can be found on the website of Plattform Lernende Systeme at:
https://www.plattform-lernende-systeme.de/anwendungsszenarien.html

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