

Research Agenda for a Ph. D. Program at Institute for Mobility Research

Evaluation of the Potential of New Business Models of Mobility in Urban Areas (incl. autonomous driving) Applying Methods of Artificial Intelligence

Commissioned by the Institute for Mobility Research (ifmo), Munich

The Institute for Mobility Research is a research facility of the BMW Group. It deals with future developments and challenges for mobility, across all modes of transport, with automobility being only one aspect among many. It focuses on social science, socio-political, economic and ecological issues, but also on cultural questions related to the key challenges for the future of mobility. The work of the institute is supported by an interdisciplinary board of renowned scientists and by representatives of the BMW Group, Airbus Group, Deutsche Bahn, Hyperloop Transportation Technologies, Lufthansa, MAN, Siemens, European Commission.

Content

Arising technologies like artificial intelligence that lead to new applications like autonomous driving that are capable of revolutionizing urban transportation are in the focus of this research agenda. Autonomous driving might push new business models from ride hailing to ride pooling to new levels. The way the car is used and who possesses the assets might completely change. How this change is going to evolve depends on a variety of factors, that are closely linked to the fundamental characteristics of cities. Thus, the research agenda could be departed into two aspects:

1. formation of city categories based on factors that determine mobility (eg income, population density, governance structure, regulation, infrastructure, etc.)
Which factors are determining mobility in a city? How do structural factors like density, income, infrastructure frame the potential of new business models? How can cultural/sociological factors be incorporated? How can city categories be built according to the above results?
2. Evaluation of the mobility stack (value creation) including mode split and new business models in each city category
Which factors are relevant for the mobility stack in a city? Which new business models are emerging due to autonomous driving? What are success factors for these business models? How could their potential be evaluated (qual./quant.)

This project is highly interesting from two viewpoints: mobility research on urban areas in a systematic large scale way is still at the very beginning, there is a lot to gain. The analytical challenge in this project has up to now usually been tackled "by hand" with conventional data modelling techniques. There is always a strong constraint to scaling due to the complex data sets that we are working with in this field. We have strong complexity on the input as well as on the output side, so the blackbox in between might be worthwhile to look at with methods of artificial intelligence. This is a unique opportunity of applying AI in a field that is still strongly dominated by conventional methods and it is a field that is looking at a very broad, overarching problem. It is not about a single technical solution but

about a whole system that is changing. Grasping this change and getting an analytic idea on what is happening could be of enormous contribution not only in the development of new business models but in the whole understanding of the functioning mechanisms of cities.

As we have done research in this area for years there is a lot of material and insight to build on. This could be of enormous help to the student to build strong competencies not only in AI but also in the field of strategic business development.

Competence Profile

Master with strong background in artificial intelligence

Excellent English skills, some German might be of help to get onboard of a mainly German speaking company

Good visualization skills

Creativity, openness, flexibility, keenness on endeavouring in new approaches

Contact

Institute for Mobility Research

A Research Facility of the BMW Group

Dr. Irene Feige

80788 München

E-Mail: Irene.feige@ifmo.de

Tel: +49 (0)89 382 34967