



The Future Use of Autonomous Vehicles

Technology, Public Policy, and Business

20 June 2019 | 11:00-18:00
PSL University, Room 5
60 Rue Mazarine, 75006 Paris
Registration at ffj@ehess.fr

The autonomous vehicle (AV) is set to deeply transform the landscape of the automotive industry and the use of cars in our society. However, the transition to autonomous driving presents enormous uncertainties. This workshop aims to contribute to the debate on the technical, socio-economic transformation linked to the arrival of the AV, focusing on some of the fundamental elements of this transformation: technology, public policy, and business. In particular, the following topics will be discussed: historical trajectories of AV technology, pending technological challenges, public policy on AV deployment, and demonstration experiments of autonomous mobility. In addition, leadership change in the global AV industry and future scenarios for AV business platforms are also to be addressed in the workshop. Comparative perspectives among countries are emphasized in this workshop to improve our understanding of the key aspects of the future use of AVs and AV-based new mobility services.

Programme

11:00 | Forty Years of Research on Autonomous Driving in the US, Europe and Japan: A Transnational Study on Pioneers, Innovations and Technological Change

By Fabian Kröger (Centre d'Histoire des Techniques - Institut d'histoire moderne et contemporaine)

The vision of autonomous driving is nearly hundred years old. It was never realized on the road, but it has a very rich transnational research history. We will present some results of our ongoing study on pioneers and innovations in forty years of research on autonomous driving in the United States, Europe and Japan (1960-2000). The first half of the 20th century was dominated by the idea to steer a car with guide-wires in the road. This vision, explored in the US and Japan during the 1950s and 1960s, depended on the infrastructure. With the miniaturization of microelectronics in the 1970s autonomous vehicles with on-board computers became possible. First in Japan and the US, later in Germany, research focused on an automobile that can "see". During the 1980s big computing initiatives in the US, Japan and Europe pushed the research efforts further, demo-programs followed during the 1990s. All this was before the DARPA-Challenges and Google.

11:45 | Autonomous Vehicles Technologies and Pending Challenges

By Javier Ibañez-Guzmán (Renault)

For a vehicle to demonstrate autonomous navigation capabilities, different functions need to be successfully executed: these can be summarised as sensing, reasoning and actuation. The complexities found in road networks imply that today there are different issues remaining to be addressed. The presentation provides an insight into the technologies used for autonomous vehicles with regards to examples of work done within Renault. It will then investigate the challenges in terms of deployment as well as pointers on where work still needs to be done for this class of vehicles to be successfully accepted by society.

12:30 | Lunch Break

14:00 | Welcome Remarks

By Sebastien Lechevalier (EHES, President of FFJ)

14:15 | Public Policy on Autonomous Vehicles in Korea and Japan

By Jee-hoon Ki (EHES, FFJ/Renault Fellow)

Autonomous vehicles (AVs) are expected to substantially transform the landscape of the automotive industry and the use of cars in our society. Governments in many countries have been formulating public policies on AVs to embrace this new paradigm. Public policy is instrumental in socio-economic transformation especially when a new technological paradigm is emerging because public policy provides the "rules of the game" that affect practices and behaviors of consumers, producers, and intermediaries in a sector. The present study comparatively analyses public policy on AVs in Korea and Japan. Similarities shed light on the common components of a policy package on AVs while differences indicate characteristics unique to the respective countries in the formulation of public policy on AVs. Given that public policy affects practices and behaviors of actors in a sector, the findings of the present study contribute to a better understanding of the different trajectories of socio-economic transformation of the three countries in the coming era of AVs.

15:00 | Demonstration Experiment of Autonomous Minibus in Switzerland, France and Japan

By Soichiro Minami (Chuo University, Former FFJ/Valeo Fellow)

The purpose of this presentation is to elucidate how we realize the social implementation of autonomous vehicle technology by analyzing case studies of autonomous minibus experiment in Europe and Japan. Autonomous vehicle would solve various transportation problem and improve quality of life (QOL) of less-mobility persons, though it has some risk and uncertainty in safety. So one must inspect impact of Autonomous vehicle about not only technical matter but also improving QOL and impact to Regional society by demonstration experiment. In Europe, experiments have ever made under the initiative of Local Governments as a long term or permanent

bus service. People can use autonomous minibus by daily use. In Japan, largest experiments have ever made under the initiative of Central Governments, as a one-time event. Recently, demonstration experiments by private companies are also increasing. The implication is that initiative of Local governments is important, so it is needed to promote decentralization of Demonstration Experiment of new mobility technology.

15:45 | *Coffee Break*

16:10 | Business Platforms for Autonomous Vehicles within Urban Mobility

By Fabio Antonialli (CentraleSupélec - Université Paris-Saclay)

With mobility becoming a key factor affecting citizen's well-being and life-quality, innovative schemes such as P2P ridesharing business models and Mobility as a Service (MaaS) concepts can have significant impacts to existing urban transportation business models. Furthermore, one of the most disruptive technologies regarding the future of urban transportation, is the insertion of Autonomous Vehicles (AVs). In this sense, the present study aimed at creating future scenarios for Business Platforms for AVs in urban mobility contexts. We proposed 4 scenarios with real-word examples present in urban mobility today, extrapolated to a future reality in which AVs are seen as a transport mode; (A) B2C autonomous ridesharing; (B) P2P autonomous ridesharing; (C) B2C multimodal mobility and; (D) P2C + P2P multimodal mobility. For scenarios A and B the prevailing business model is autonomous ridesharing which can be explained by business platforms theory, meanwhile for scenarios C and D the underlying business model is sustained by MaaS schemes where business platforms theory is tied to business ecosystem theory to explain value creation and distribution. We conclude that, besides the unlikelihood of scenario C, any of the others three have potential to become a reality whether AVs become an urban transport mode.

16:55 | Technology Shock, Microdynamics, and Industrial Leadership Change: Case of Autonomous Car Industry

By Youngsam Chun (Seoul National University)

A technology shock triggers industrial leadership changes in a knowledge-intensive industry. We investigated the firms' microdynamics in response to the technology shock in the global autonomous car industry. Results of our study of 142 firms in the industry, measuring the tie formation pattern of interorganizational innovation network, show that the technology shock promoted a network transformation into the decentralized structure by inducing incumbents to reconfigure their networks and it gives temporal windows of opportunity to the latecomers.

17:40 | Conclusion

Speakers



Fabio Antonialli (Paris Saclay University)

Doctor and Master in Administration from Federal University of Lavras (Brazil) and also holds a degree on Administration from the Federal University of São João del Rei (Brazil). Research interests include: business models and business platforms of autonomous vehicles and urban mobility, productive chains, consumer behavior, organizational networks and innovation. Experience in the areas of general administration, human resources, business strategies, marketing strategies, logistics and languages teaching. He is currently a postdoctoral researcher at the Laboratoire Génie Industriel (CentraleSupélec / Université Paris-Saclay - France), developing research on the economic and social implications of autonomous shuttles for collective transports within the scope of the European project AVENUE H2020.



Youngsam Chun (Seoul National University)

Ph.D. Student, at Seoul National University in Korea. Currently studying the effects of technological innovation on the industrial system based on complex network theory. He has over ten years of experience in researching convergence technologies between the automotive and ICT industries at the telecommunication lab in Korea and has an US patent (US8948929B2) on autonomous vehicles.



Javier Ibañez-Guzmán (Renault)

Javier Ibañez-Guzmán obtained his Ph.D. at the University of Reading on a SERCUK fellowship, and his MSEE at the University of Pennsylvania (USA) on a Fulbright scholarship. In 2011, he was a visiting scholar at the University of California, Berkeley, working on connected vehicle applications. He is currently a member of the technical staff at Renault S.A., carrying out work on autonomous vehicle navigation technologies and driving assistance systems. Formerly he was a senior scientist at a national research institute in Singapore, where he spearheaded work on autonomous ground vehicles operating in unstructured environments, he was also an adjoint associate professor at Nanyang Technological University. Dr. Ibañez-Guzmán has several publications and patents in the robotics and automotive domains. He has successfully supervised several Ph.D. students. He is a C.Eng. (UK) and Fellow of the Institute of Engineering Technology (UK).



Jeehoon Ki (EHESS, 2018 FFJ/Renault Fellow)

Jee-hoon Ki is an associate research fellow at the Korea Institute of Science and Technology Evaluation and Planning (KISTEP). He holds a PhD in Economics at Seoul National University, Korea. His research focuses on industrial leadership shift from incumbent countries or firms to latecomers when a new techno-economic paradigm emerges. As the 2018 Renault/CEAFJP fellow of the Fondation France-Japon (FFJ) de Ecole des Hautes Etudes en Sciences Sociales (EHESS), he is now studying the public policy on autonomous cars in France, Japan, and Korea from a comparative perspective.



Fabian Kröger (IHMC)

Fabian Kröger holds a PhD in History of Technology and Cultural Sciences from the University Paris 1 Panthéon-Sorbonne and the Humboldt-University of Berlin. He is a member of the Centre d'Histoire des Techniques (Institut d'histoire moderne et contemporaine (IHMC), CNRS, ENS, Université Paris I Panthéon-Sorbonne, France. His main research topic is the Cultural history of technology, especially the technical and cultural history of autonomous driving. Actually he is writing a book about 40 years of research on autonomous driving in the US, Europe and Japan (1960-2000), financed by the University of the Federal Armed Forces, Germany.

His latest publications include: L'histoire techno-imaginaire du véhicule autonome, in: Kröger, Fabian, Maestrutti, Marina (ed.), *Les Imaginaires et les Techniques*, Presses des Mines, Paris 2018, p. 149-166; Kröger, Fabian, Weber, Jutta (Guest-editors), *Degendering the Driver?*, Special Issue, in: *Transfers – Interdisciplinary Journal for Mobility Studies*, Vol. 8, N° 1, Spring 2018.



Soichiro Minami (Chuo University, 2018 FFJ/Valeo Fellow)

Soichiro Minami is Assistant Professor at Chuo University, Tokyo, Japan. He was FFJ/Valeo Fellow in 2018. He holds a Ph.D in Economics (2013, Kyoto University). His research topics are: Economics, Public Finance, Environmental Social Science, Transportation Policy Study. His Research achievements include: French Urban Transportation Policy from viewpoint of Public Finance (Doctoral Thesis Theme), Case Study of Tram Projects in France and Spain, Public Participation in Transportation Policy, Ridesharing Service in Japanese rural area.

