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SELF-DRIVING CARS AND THE TRANSFORMATION OF PUBLIC AND PRIVATE TRANSPORTATION

DEPARTMENT OF MEDIA STUDIES
UNIVERSITY OF PADERBORN
6TH & 7TH NOV 2014
JENNY-ALONI-HAUS / IBZ

PROGRAM

THURSDAY 6. NOV. 2014

10:00	WELCOME & COFFEE
11:00 - 11:30	WELCOME by JUTTA WEBER (Paderborn)
11:30 - 12:30	ANDREAS RESCHKA (Braunschweig): A survey of vehicle automation motivated by engineers (KEYNOTE)
12:30 - 13:15	SAMUEL MÜLLER (Paderborn): The Steering Wheel in a Self-Driving Car. Car-Design and Affective Authenticity
13:15 - 14:45	LUNCH
14:45 - 15:30	FABIAN KRÖGER (Paris): Shifting gender images of autonomous driving in film and the role of the voice (1990-2010)
15:30 - 16:15	ANNA-LENA BERSCHEID (Paderborn): The future is now? Science Fiction narratives in the discourse on autonomous cars
16:15 - 17:15	COFFEE BREAK
17:15 - 18:30	(cancelled) ULF MELLSTRÖM (Karlstad): The de-anthropo-morphisation of men, masculinity and cars. Emancipatory challenges and theoretical connections (PUBLIC KEYNOTE, B3.231)
20:00	DINER AT RESTAURANT LA MAISON

FRIDAY 7. NOV. 2014

9:30	COFFEE
10:00 - 11:30	GÖDE BOTH (Braunschweig): Beyond heroism and autonomous machines. Alternative meanings in self-driving car research
11:30 - 12:15	BONNO PEL (Bruxelles): What Drives the Self-driving Car? A Social Innovation Perspective on a Technological Transition
12:15 - 13:15	LUNCH
13:15 - 14:00	MARKUS EDELMANN / SILKE ZIMMER (Karlsruhe): TA Perspectives on Autonomous Driving. Technology Assessment and an 'old' new vision of mobility
14:00 - 15:00	GENERAL DISCUSSION
15:00	FAREWELL

ABSTRACTS

KEYNOTE: A SURVEY OF VEHICLE AUTOMATION MOTIVATED BY ENGINEERS – ANDREAS RESCHKA (TU BRAUNSCHWEIG)

This talk tries to survey the motivation behind the idea of vehicle automation over roughly 100 years in the minds of engineers and give a summary where we are at the moment.

The idea is almost as old as the car itself. In the early 20th century engineers started thinking about ways to automated vehicles. In fact a car was less autonomous as a carriage because your horses could take you home without you monitoring them. Throughout the 20th century the idea of automated vehicles settled in many engineer's minds, but the technological advance was slow. Everybody was sceptic and there was an "I think it's impossible"-mentality. From 1975 to 1990 the first serious approaches were taken and in the 1990s the technology was developed to drive thousands of kilometers automated. Still with human monitoring of the vehicle guidance system, but the people's minds changed and they thought "Maybe it is possible."

In 2004 the first DARPA Grand Challenge brought the idea of fully automated vehicles to public, into universities, and companies. In 2007 the DARPA Urban Challenge pushed the technology to a new level and suddenly researchers from all over the world focused on this topic. The belief was clear afterwards: "Of course we can do this, but it is a big challenge!" In 2008 the Stadtpilot project started and brought a fully automated vehicle to the city ring of Braunschweig. The project was not motivated by safety or traffic efficiency or a transfer of autonomy from the driver to the vehicle. It was simply motivated by our "How fast can we do this?"-attitude. The first public presentations starting in 2010 at the same time with other institutions triggered predictions, which set the year 2020 as a goal. Nissan, Daimler and others spread the idea of autonomous vehicles and the goal. A big hype was inevitable and consequently the press coverage increased: "In 5 to 10 years, cars will drive alone in public traffic." - It seems that 5 years from 2010 is a bit optimistic and even 10 years are not very realistic from a today's point of view.

In 2013 the hype reached its climax, but suddenly a change took place. The first doubters weren't laughed at any more and the big challenges formed in the engineer's minds: "Maybe we were a bit optimistic in the last years. Let's rethink our ideas and correct our goals!" Now the opinion in the community is: "How can we do this safely?" Of course as soon as possible would be great, but it's more important to make it decent. The current goal is not to improve overall traffic safety, but to catch up with a human's ability to drive. Furthermore, the questions arise: "Where are we now? How good is the current

technology? What has to be done to make it better? How long does it take? Why are human drivers still superior over vehicle guidance systems?"
A comparison of human driving skills and current machine driving skills shows the state of technology in automated vehicle technology.

(cancelled) KEYNOTE: THE DE-ANTHROPOMORPHISATION OF MEN, MASCULINITY AND CARS. EMANCIPATORY CHALLENGES AND THEORETICAL CONNECTIONS. – ULF MELLSTRÖM (KARLSTAD UNIVERSITY)

As car-intensive societies move into an era in urgent need of sustainability mobility, there are many pressing political concerns that need to be addressed. Of one these is the enduring and strong connection between masculinity, power and car cultures. In this intervention I will talk about the anthromorphisation of cars and motorcycles and how this highly emotional and gendered relation needs to be challenged in order to meet social inequalities with regard to car cultures and mobility. The phenomenon of autonomous cars can here be thought of as one possible emancipatory opening in relation to a wider movement of queering and de-gendering technological artefacts. As we start to challenge the deep-rooted connection between cars and masculinity we are also questioning the baselines of a gendered economy founded on control, speed, pleasure, sexuality and embodiment. The theoretical connections can be drawn in many possible directions, but I will here focus on how autonomous cars can be part of a de-anthropomorphisation and de-masculinisation of car cultures, and which I argue is a necessary move for sustainable mobility and a democratic transport system.

THE STEERING WHEEL IN A SELF-DRIVING CAR. CAR-DESIGN AND AFFECTIVE AUTHENTICITY – SAMUEL MÜLLER (UNIVERSITÄT PADERBORN)

Taking a look at how autonomous driving is imaged in the media reception suggests that the car faces significant changes in its functionality as well as in its physical appearance. Transferring main parts of the agency while driving from the human driver to sensor- and processor-networks would influence the usage and design of the car as we know it. Beginning with rotating laser sensors on its roof and other visible technology marking cars as ‚autonomous', towards the 'abolition of the steering wheel, even the development of 'rolling living rooms' - a lot is imagined as possible when drivers become passengers. (Berscheid 2014) Until today, all visions of the new car stay within the boundaries of design and use-case studies, prototypes and 'science fiction'. However, the way

(German) car manufacturers imagine (or actually build) self-driving cars differs significantly from how media pictures this technology. Except for minor changes and small, visually distinctive characteristics, autonomous cars shall not change significantly from today's automobiles.

An analysis of material of an own laboratory study including interviews with engineers working in the development of self-driving cars reveals this 'design conservatism' as well. But furthermore some indications are given towards a development of an understanding of the importance of these cautious design decisions in the context of the engineering process and its assumed public reception. The attempt to stay close to the common design of the traditional, manually steered car, I like to suggest, can be understood as an attempt to strengthen this technology by addressing the 'affective landscapes' built around the automobile for decades (besides being also a reaction towards safety issues and hitherto unresolved legal questions). Thus, the confusion of cultural bonds towards the manually driven car is curbed.

In my paper I want to show how the ongoing automatization of cars that seems to influence the cultural arrangements around automobility in numerous and crucial aspects - from gendered notions of agency and autonomy to changing models of property and usage - is made culturally appropriate by intertwining the autonomous car within patterns of what I like to call an 'affective authenticity'. By the construction of affective continuities through contextualization in common narratives around the traditional car, the self-driving car is made adjustable within the 'system of automobility' (Urry 2004), that is not only based on technological, material or legal arrangements, but as well on 'emotional geographies' (Sheller 2004) which go along with a distinct 'automotive subjectivity' (Manderscheid 2013). The design is a means to stabilize the affective architectures around the car that are troubled by significantly re-arrangements of the human-car-relationship. Moreover, I suggest, re-arrangements of the affective, emotional and subjective constellations are primed by specific notions and contextualizations of safety, comfort and driving pleasure related to the car's physical appearance that are meant to conserve an 'authentic' relation to car use and driving.

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SHIFTING GENDER IMAGES OF AUTONOMOUS DRIVING IN FILM AND THE ROLE OF THE VOICE (1990-2010) – FABIAN KRÖGER (UNIVERSITÉ PARIS I PANTHÉON-SORBONNE HUMBOLDT UNIVERSITY BERLIN)

Has the automatization of driving the potential to de-gender the driver? The following keynote will start from this big question. It is more than likely, that the affective economy of cars change when a computer replaces the steering wheel. But how this transformation of our car culture will take place, remains an open question: A large-scale traffic with autonomous cars hasn´t been realized yet, so there is no empirical data available.

But we can explore the history of the imaginary of this technology. From the perspective of cultural studies and history of technology, this keynote will analyze the shifting gender images of autonomous driving in film (1990-2010). The presentation will analyze the gender-specific discourses that are pronounced by male and female characters in these films, including machines. Special attention will be given to gendered voices as human machine interfaces. How does the figures in the film interact with the car if it has a female or a male voice?

The keynote will examine sequences from five films: The futuristic thriller Demolition Man (1993) directed by Marco Brambilla, The Fifth Element (1997) directed by Luc Besson, The 6th Day (2000) directed by Roger Spottiswoode, Minority Report (2002) directed by Steven Spielberg and I, Robot (2004) directed by Alex Proyas.

Most of these films are featuring driverless cars with a female voice-interface. In all of the cases, the male drivers/passengers are more or less in conflict with the feminized version of the autonomous car. Confronted with the powerful phenomenon of an authoritative female voice without body, they try to escape from the car or to destroy the system. Autonomous driving can been associated with a specifically male fear to loose control over the machine - that means over the male body. But a closer look at these films can also show a shift from resistance to greater acceptance of driverless cars.

To contextualize these findings, the presentation will confront the shifts in film with market research about the acceptance of gendered voices in navigation systems. Interestingly, during the 20 years from 1990 to 2010 the driver acceptance shifted radically from a preference for male to female voices. At the end of the 1990s, BMW had to recall his BMW 5 series because its navigation system featured a female voice. At the end of the decade 2000 market research shows a broad preference for female voices.

These small shifts that are visible in cinema and in consumer preferences are perhaps a sign how difficult it will be to de-gender the driver.

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Batman (1989, Tim Burton) Total Recall (1990, Paul Verhoeven) Demolition Man (1993, Marco Brambilla) Tomorrow never dies (1997, Roger Spottiswoode) Das fünfte Element (1997, Luc Besson) The 6th Day (2000, Roger Spottiswoode) Minority Report (2002, Steven Spielberg) I, Robot (2004, Alex Proyas)

THE FUTURE IS NOW? SCIENCE FICTION NARRATIVES IN THE DISCOURSE ON AUTONOMOUS CARS – Anna-Lena Berscheid (Universität Paderborn)

According to recent media reports, the autonomous, self-driving car is the technology of the future.

Experts claim that autonomous cars could solve problems modern societies are currently facing, such as air pollution or fatal car accidents, but also the social exclusion of specific groups like the elderly or disabled people.

But to what kind of future are journalists and experts referring in the media coverage? Do they have Utopia in mind when they think about autonomous cars or do they rather create dystopian imaginations of future mobility in which machines take over the world?

In this paper, I want to explore the different meanings of "futurity" that are negotiated in the German media discourse on autonomous cars. It is especially striking that a lot of authors are using Science Fiction metaphors to describe the impressions the new technology had on them. Basing my analysis on findings regarding the representation of (auto)mobility and technology in different Science Fiction genres, it is my aim to show how these analogies either express dystopian views or a much more optimistic expectation of how a future with autonomous car could be.

Furthermore, I want to ask what authors might implicitly want to tell us when using Science Fiction metaphors. This question is especially interesting for me as I am working on the interdependence of the autonomous car as a new technology and the highly gendered mobility culture of our time: What kind of societies are imagined when referring to Science Fiction and what role does gender play in these?

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BEYOND HEROISM AND AUTONOMOUS MACHINES: ALTERNATIVE MEANINGS IN SELF-DRIVING CAR RESEARCH – GÖDE BOTH (TU BRAUNSCHWEIG)

Since 2010 robotic cars, also known as autonomous vehicles or self-driving cars, have been put to test in real-life city traffic. Traditionally, experiments in robotics are conducted under the controlled conditions of closed lab spaces. These research groups, however, tackle with the open-ended messiness of traffic, where all sorts of actants intra-act – car-driver hybrids, bike-rider hybrids, pedestrians, other animals, streets, signs, weather conditions and many more. Self- and media- representations often erase the complexities and messiness of self-driving car research by drawing on the dominant images of autonomous machines and heroic inventors.

In my contribution to the workshop I will identify alternative meanings that might be overlooked by the dominant images of self-driving cars. By scrutinizing the practice of test-drives with experimental vehicles, I will complicate existing accounts of self-driving car research. I will highlight the importance of caring for the robot and embodied ways of knowing among with the multiplicity of translation processes.

My analysis will be grounded in empirical material generated by original ethnographic research among members of a research group based at a German university. My research is guided by (Post-)Actor-Network-Theory (Latour, 2005; Law, 2004; Mol, 2002) and cultural anthropology (Downey and Gary, 1998; Suchman, 2007).

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WHAT DRIVES THE SELF-DRIVING CAR? A SOCIAL INNOVATION PERSPECTIVE ON A TECHNOLOGICAL TRANSITION – BONNO PEL (UNIVERSITÉ LIBRE DE BRUXELLES)

Amongst the multitude of contemporary emergent innovations, the self-driving car stands out as an icon of technological innovation. The car itself is already a symbol of Enlightenment self-determination and the associated innovative spirit. Not surprisingly therefore, its further development towards automated driving is often seen as a most appealing technological paradigm change or transition. Regarding the latter, literature on socio-technical transitions urges to consider this innovation in the context of a broader mobility system (Urry 2004 2007; Geels 2012): This reminds that the technological revolution co-evolves with mobility behaviours and cultures, transport policy, the investment strategies of car manufacturers, and various landscape changes such as climate change and geo-politics. Moreover, it reminds that mobility innovation is unavoidably shaped by a car-dependent mobility 'regime', which favours some innovations and discourages others.

Still, this socio-technical transitions perspective is prone to overemphasizing the technological aspects of the self-driving car. Through its normative orientation towards sustainability, the socio-technical transitions perspective is inclined to highlight typical 'smart mobility' gains such as congestion abatement, traffic safety improvements, ecological efficiency and modal shift (Pel et al. 2014). Arguably, the less tangible reconfigurations of mobile lives and 'mobilities' (Urry 2007) merit more attention in transitions research (Cohen 2006 2011, Pel forthcoming) – especially as the 'cracks' in the mobility 'regime' seem to come from outside the mobility system (Sheller 2012).

For these reasons it seems promising to consider the self-driving car from the perspective of social innovation (Moulaert et al. 2005; Westley & Antadze 2010). Such perspective is counterintuitive, of course: Apparently, the distinctly high-tech character of the innovation in focus is neglected. Still, this only provides a contrasting perspective to the technological determinism that pervades the Intelligent Transportation Systems (ITS) field. This contribution therefore pursues a social innovation perspective. It is aimed to shed light on the many changes in mobile cultures that shape the selection environment for the self-driving car. As mentioned, these changes and innovations need not emerge within the mobility system itself – a social innovation perspective is also promising for this broad outlook. This allows to draw conclusions, and specify further questions, on what is driving the self-driving car.

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TA PERSPECTIVES ON AUTONOMOUS DRIVING. TECHNOLOGY ASSESSMENT AND AN 'OLD' NEW VISION OF MOBILITY – MARKUS EDELMANN / SILKE ZIMMER (KIT KARLSRUHE)

In recent years, the media as well as vehicle manufacturers presented a vision for autonomous driving (AD) as a smart mobility future: as safe and convenient as possible and totally connected with the environment, the autonomous car would bring its passengers to their destination. The self-driving car would thereby reduce environmental impacts and provide more personal and private spare time for the passengers, to be enjoyed during their stress-free trip. (1)
It is not clear, though, which impacts the rollout of such a technology might have on society. This issue (and other ones) is part of the activities of Technology Assessment (TA). TA in general appraises scientific and technological developments, with a focus on socio-technical impacts and possible systemic and unintended effects. (2) Meanwhile, it has begun to engage with the conditions of possibility and the impacts of autonomous driving. Topics TA will deal with in relation to AD are for example:

- the legal aspects: Who will be responsible in case of an accident? How much responsibility can be charged on the driver in a suddenly occurring situation?
- the expectations and imaginations connected with self-driving cars: Which expectations/imaginations does society have of AD? Do they correspond with the ones of the designing engineers? In which aspects do they differ?
- questions of human-machine interaction: What will or could human-machine interaction look like? Will technologies solve the problem of 'in/out of the loop' in human-machine interaction?
- market-related aspects: Does AD really have the potential to attract end-consumers in order to replace 'car-emotion imaginations' such as liberty, fun, and power? Could AD be a promoter for alternative propulsion systems?
- "classical" risk analysis under systemic aspects: Which challenges are posed to traffic systems and the infrastructure as a whole? What happens in case of malfunctions within the system?
- Envisioning smart mobility, TA will suggest narrative storylines, i.e. scenarios (3) of what futures could look like if all assumed developments are taken into account. As an example, the impacts on all kinds of 'driver' jobs will come into focus: Drivers may first get in touch with technical innovations, as the ITS example of the taxi App Uber has recently demonstrated. (4) In a prospective view, several scenarios of the impact of AD are being taken into consideration, such as possible fast-changing job profiles which have to be adapted by employees or (the worst-case scenario) be replaced by AD systems. (5)

Working in the field of TA and foresight as an historian, one will soon find parallels to past examples. The imagination of AD isn't new (6) and self-driving cars as well as other – even self-flying – means of transport have regularly been announced in the past. Even if simple analogies won't make a "learning" out of history, a look back into the past can be fruitful not only for TA. We would like to present current challenges for Technology Assessment on autonomous driving and how they could be met.

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NOTES


NO
DRIVER