Legal and Ethical Challenges for Driverless Cars and Smart Roads

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Context

- **Driverless cars**
  - » Level 4 and Level 5 on the autonomous vehicle scale – no driver at all, with a computer making all decisions once a navigation target and some basic rules are set

- **Smart roads**
  - » Road networks that interact with all vehicles and road infrastructure (traffic lights, speed limits etc.)
  - » Most vehicles from 2018 will be fitted with an automatic transponder and older vehicles can be retro-fitted
  - » Modern roads have some smart infrastructure built in – more on the way

- **Driverless cars and smart roads are a rapidly emerging technology** – the law is famously poor at keeping up with new technology

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Top 6 Legal and Ethical Challenges

- **1. Privacy**

- **2. Safety and Selection**

- **3. Liability**

- **4. Cultural Differences**

- **5. Traffic Priorities**

- **6. Trust**

1. Privacy

- **Constant broadcast**
  - » A typical transponder broadcasts vehicle type and make, speed, braking, acceleration, indicators etc.
  - » The transponder is identified by a signed digital certificate (to avoid fraud and impersonation)

- **Access requests**
  - » Requests will be common for both live and historical movement and location data - from law enforcement, lawyers in civil disputes, general traffic management etc.

- **Privacy law**
  - » Privacy law currently relies on notice and consent (difficult for vehicles) and in any case provides huge exceptions for law enforcement, emergencies etc.

- **Privacy by design**
  - » A Privacy Impact Assessment can often identify solutions – for example, in one 'privacy friendly' option a bundle of certificates for each transponder can be randomly shuffled

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2. Selection

- **Safety and selection**
  - » Often called 'The Trolley Problem' – where an accident resulting in a fatality is unavoidable, how do you decide who should die?
  - » You can even 'play' a game based on the Trolley Problem at MIT:
  - » **http://moralmachine.mit.edu/**

- **Case study: Germany (Guidelines 2017)**
  - » Self-driving cars must **prioritise human life over property and animals**.
  - » Self-driving cars must **do the least amount of harm** if put into a situation where hitting a human is unavoidable
  - » Self-driving cars must **not discriminate** based on age, gender, race, disability, or any other observable factors.
  - » **http://www.bmvi.de**

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3. Liability

- **Overview**
  - » A common approach to determining liability is to assess which party has the greatest ability to avoid damage. A supplementary test is which party has the greatest ability to compensate for any damage

- **Vehicle manufacturers**
  - » In order to build confidence in driverless cars, some manufacturers have offered an indemnity for any damage (but check the fine print!)
  - » Manufacturers are unlikely to be able to avoid liability for any damage resulting from their **negligence** in design or implementation (due to consumer protection laws - but these laws differ from country to country)

- **Owners**
  - » Owners may be pressured to accept some liability (e.g. in contracts). There are protections against unfair contract terms in the UK.

- **Insurance**
  - » Compulsory insurance is likely to be the long term solution to liability issues for driverless cars – the manufacturer indemnities are more akin to an introductory offer or stunt

4. Cultural Differences

- **Driving is cultural**
  - » More than just the left / right divide – there are numerous national and regional differences in driving behavior and traffic management
  - » Most approaches are based on customs or etiquette, but some are enshrined in law

- **Managing cultural differences**
  - » This will be challenging if algorithms for driverless cars are developed in just a handful of jurisdictions, or if AI is based on data initially obtained from just one culture.
  - » Recent developments in AI have demonstrated an ability for AI to develop new knowledge itself, raising questions about 'who is really in charge'.
  - » The most difficult phase will be when driverless cars and traditional cars have to share limited road space

5. Priorities

- **Smart roads will have the ability to prioritise specific vehicles and manage overall traffic patterns**
  - » General recognition that emergency vehicles will receive priority from driverless cars and smart road infrastructure (e.g, traffic signals)
  - » Some successful pilots of smart roads allowing individual heavy goods vehicles (and convoys) to reach a destination with minimal stopping (reduces environmental impact and road maintenance)

- **Who determines these priorities?**
  - » Significant potential for conflict, bias and influence
  - » Potential for entrenching privilege / disadvantage

- **AI and priorities**
  - » In one AI experiment the AI becomes more aggressive as the challenge becomes more competitive

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6. Trust

- **Trust is a key issue when you are relying on an algorithm to make key decisions**
  - » Users may not be able to see or understand the details of the algorithm
  - » The algorithm may make selections or priorities without the consumer being aware
- **Trust in the vehicle / transport sector is in crisis - many industry players are 'disrupters' who have gone to great lengths to avoid or undermine regulation**
- **For example, Uber is a leading player in the driverless car sector. They have been the subject of a series of controversies, including:**
  - » Two major privacy breaches where senior management directed staff to place 'opponents' (journalists) under surveillance and even directly threatened journalists with revealing their personal data
  - » Revelations that Uber had developed and used specific software (Greyball) to identify and avoid regulatory staff (e.g. inspectors)
- **Numerous vehicle manufacturers have also been caught up in the emissions testing fraud scandal**

Conclusion

- **Overall, driverless cars and smart roads have the potential to deliver significant benefits**
  - » Driverless cars are not affected by fatigue, alcohol, health conditions and distractions
  - » Smart roads and transponders allow vehicles to 'see' traffic hidden by hills, corners, fog, snow and blinding light
  - » Traffic management and vehicle priority (e.g. emergency vehicles) are enhanced by smart roads and transponders

- **However, key issues will require careful management, including direct intervention and regulation**

- **AI and algorithms need to be transparent and subject to rules and restraints**

- **The core approach should be: "Even if there is no driver behind the wheel, a human is always in charge"**

Further information

- **Galexia**
  - » http://www.galexia.com/

- **US database of driverless car legislation**
  - » http://www.ncsl.org

- **Privacy Impact Assessment on Smart Roads (Australia, 2017)**
  - » http://www.galexia.com/public/about/news/about_news-id470.html

- **Germany: Guidelines on Driverless Cars and Ethics (2017)**
  - » http://www.bmvi.de/