In-car Voice and Audio Recognition - Driverless Cars & Multi-Modal Transportation: Natural Language Processing

The development of self-driving and driverless cars forms a great example of how natural language processing is being adopted into cutting-edge technologies. In the case of driverless cars, AI and Machine Learning have formed the basis of how the car understands it's environment and how to reach in almost every scenario. The cars have hundreds of sensors to detect motion, neighbouring vehicles, traffic light signals amongst many other IoT data sources, LIDAR, GPS, etc. to allow these cars to continually become safer.

The first example of a self-driving car came in 1989 where ALVINN (Automatic Land Vehicle in Neural Networks) was used to "detect lines, segment the environment, navigate itself, and drive" (Huffington Post, Oscar Williams (2016). Nowadays, AI and Machine Learning techniques are increasingly being used for in-car entertainment (Autonomous Vehicle International, 2019), allowing for user/passenger to choose what they want to watch, listen to, choice of temperature in vehicles, windows down/up etc. This also helps to contribute to the consumer "trust" with autonomous, driverless vehicles. To give an example, a passenger can tell the vehicle to pull over when they want to stop and depart from the vehicle, maybe to arrive at the office, and the autonomous vehicle would stop and the next safest position, place his indicator on and pull into the curbside of the road that's it on. The doors would open autonomously and safely, the passengers would leave and possibly even 'tap' their phone's to pay and the car would then depart to the next person. This will have been supported by models such as Question Answering in order to recognise questions from the passenger and execute the best response, verbally and coordinate the vehicle's actions.

ADAS and in-car navigation systems are other examples of how NLP is being adopted into the design and development of the next-generation of transportation, Mobility as a Service technology progression.

Adoption hasn't really begun and only when political and consumer confidence is built, will we see a drive to electric, driverless, multi-modal transportation system within high-performing, energy efficient, sustainable hubs and communities.