Six parts of your car that gather data on you

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Credit: AI-generated image (disclaimer)

You can tell a lot about someone from the car they drive. The data that many vehicles now collect can reveal the patterns of our daily lives and provide insights into our behavior, actions and even our state of mind.

Vehicle forensics is a type of digital forensic science that focuses on the identification, acquisition and analysis of data which has been stored by cars, vans and lorries.

Originally, vehicle forensics mainly related to the external identification of stolen cars or tax and MOT violations by the use of the ANPR (automatic number plate recognition) system in the UK. The system was invented during the 1970s but did not become widely used by the police until the late 1990s. ANPR works by scanning number plates and checking them against a database of vehicles of interest.

However, in recent years, the process of prosecuting offenders has become more sophisticated and now also encompasses the extraction of data from inside vehicles. From the mechanisms used to enhance the driving experience to inbuilt entertainment systems, all can assist in the detection of crime and can be admissible as evidence in court.

1. The black box

Black boxes are devices used within vehicles to monitor an individual's driving skills. They are not present in every vehicle but they are popular with insurance companies. If the data from the black box reveals a driver is performing well behind the wheel, it can be used to lower their premium.

Alongside recording GPS coordinates, black boxes can show how far a vehicle has traveled, how often it has been driven, as well as braking and cornering ability, for example.

2. The infotainment system

Listening to music while driving used to involve a simple cassette or CD player. But slowly these systems gave way to Bluetooth, wifi and USB devices, which can be operated by using touch screens or displays installed on dashboards.

As well as providing information and entertainment, the infotainment system is often how drivers interact with other functions of the vehicle, such as displaying how much fuel has been used and controlling how warm the seats are.

When smartphones are plugged into cars or paired via Bluetooth, the infotainment system can store data such as navigation history, text messages and emails, internet browsing history and social media feeds, as well as Bluetooth and cell tower connections.

3. Electronic control units

Electronic control units or ECUs assist with how a vehicle works and are often described as the "brain" of the engine. They are situated within the car's interior, usually in the glove compartment, engine space or under the dashboard. Essentially, an ECU is a computer, a switching system and a power management system housed within a very small case.

There are usually more than 75 ECUs in a vehicle and each one is responsible for a certain task. For example, the engine ECU controls the injection of the fuel and, in petrol engines, the timing of the spark to ignite it. Fastened seat belts, air pressure, and lights turning on and off are also all functions of ECUs.

To assist with driver efficiency, the ECUs and the infotainment system often work together, storing a wide variety of data about the ways in which a vehicle is used.

4. eCall units

Emergency call, or eCall, units were introduced to new vehicles across the EU and UK in 2018. This is an emergency system that aims to bring

rapid assistance if and when there are road traffic incidents. Vehicle sensors can identify collisions and can detect if the airbags have been deployed. This in turn activates a call to the emergency services.

The data collected by eCall includes the vehicle's GPS coordinates, the direction of travel, the VIN (vehicle identification number), the type of fuel used and even whether seat belts were fastened or not.

5. Key fobs

Beyond their most obvious function in locking and unlocking our cars, key fobs contain a remarkable amount of information. Some of the data stored within a fob includes the VIN, the number of keys paired to a particular vehicle and the last time the vehicle was locked and unlocked.

6. Cameras

Reverse and dashboard cameras can assist with parking and provide accident footage for insurance investigators. But they can also reveal the journey traveled by the vehicle alongside date and time stamps, as well as road positioning.

Additionally, dash cameras can capture images of other road users and pedestrians. The national dash cam safety portal allows camera owners to submit footage to police forces in England and Wales, which can then be used by investigators.

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