Artificial Intelligence: The Brain of Autonomous Cars

Autonomous Cars

The US National Highway Traffic Safety Administration (NHTSA) estimates 94% of all traffic accidents are a result of driver error[1]

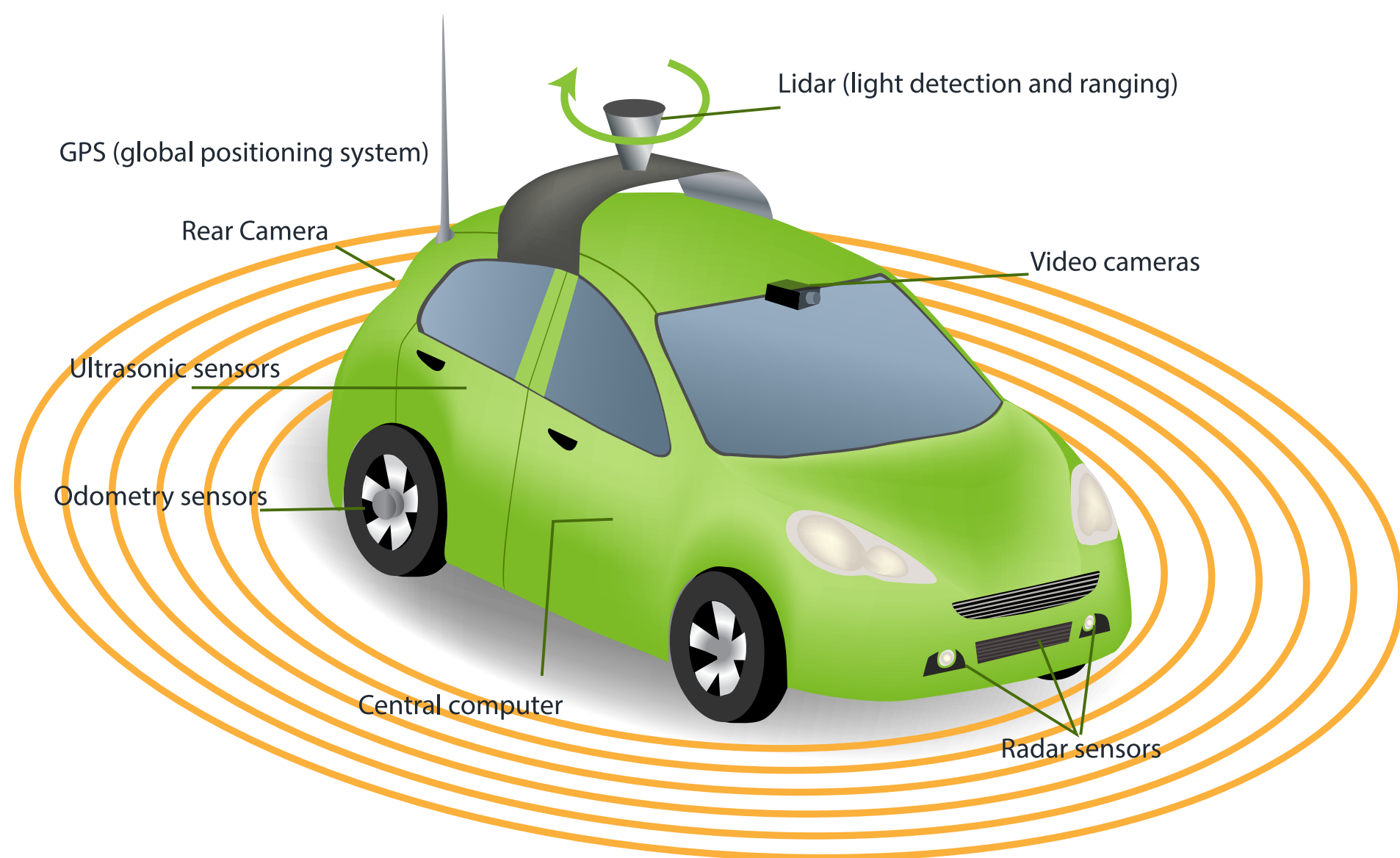Autonomous cars are predicted to save up to **10 million** lives per decade

Major automakers have invested over $80 billion in autonomous vehicles over the last three years[2]

Automakers have ambitious plans to produce fully autonomous (SAE Level 5) cars requiring zero human intervention in the next three to five years

Autonomous cars collect data from multiple sensors on the exterior and interior of the vehicle and also exchange information with other cars and infrastructure while on the road

- Lidar (light detection and ranging)
- GPS (global positioning system)
- Rear Camera
- Video cameras
- Ultrasonic sensors
- Odometry sensors
- Central computer
- Radar sensors

1. National Highway Traffic Safety Administration - Critical Reasons for Crashes Investigated in the National Motor Vehicle Crash Causation Survey
2. Brookings - Gauging Investment in Self-Driving Cars

Data: The Driver Behind AI

IoT With connected devices increasing across multiple industries, more data than ever is now being collected

In 2017, 250 exabytes of data was generated by the nascent autonomous car industry

Massive amounts of data is used to create AI algorithms through analytics that mimic human cognition

AI can determine what data is valuable and leveraged to improve system functions, including what data should be placed into storage for future access

By 2020, 250 million vehicles will be connected to each other and the surrounding infrastructure.[2] These vehicles will share information about changes in traffic, road conditions, weather, and more

Big Data in cars will become a multi-billion industry by 2030[3] **$750B**

2. Gartner - By 2020, a Quarter Billion Connected Vechiles Will Enable New In-Vehicle Services and Automated Driving Capabilities
3. McKinsey & Compnay - Monetizing Car Data

Machine Learning

Machine learning is an application of AI that uses statistics to give computers the ability to independently learn and improve performance without being explicitly programmed

Deep learning is a type of machine learning that uses artificial neural networks layered on top of each other to analyzing massive data sets and retrieve structured information

Deep learning will be particularly useful for autonomous cars to tell the difference between vehicles, pedestrians, and city infrastructure

Estimates predict that it will take around 14 to 16 million miles of driving to collect enough data to train the neural networks that will eventually make fully autonomous cars feasible and safe

39% growth rate
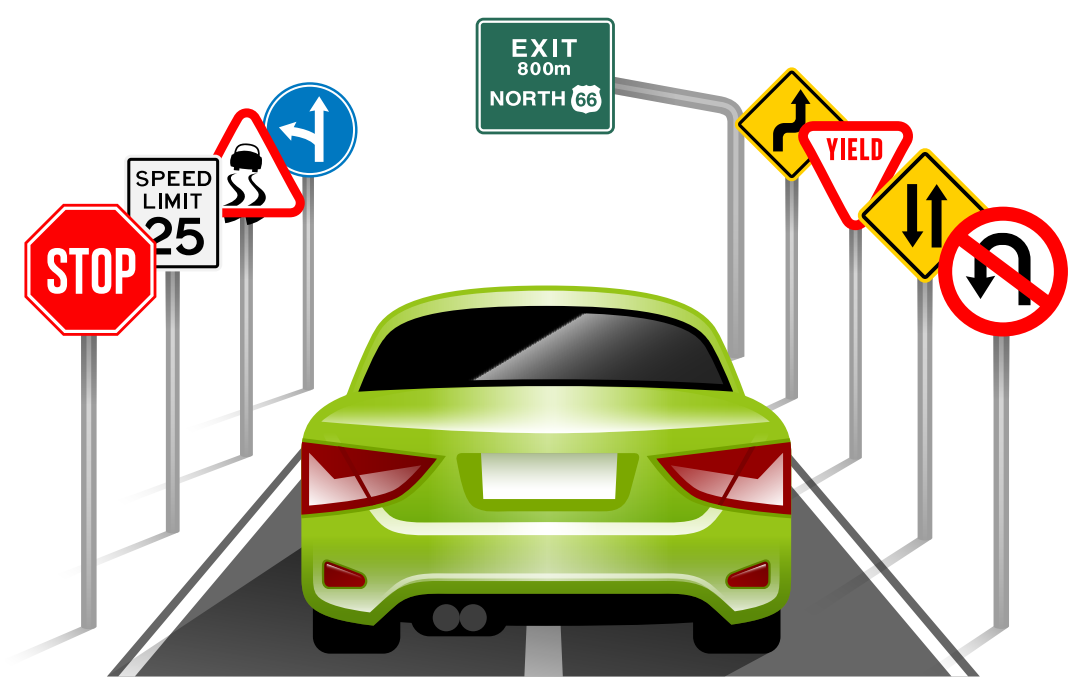
Rising demand for intelligent vehicles and improved user experiences will lead to massive market growth for automotive AI, predicted to reach up to $10.8 billion by 2025[4]

4. Bizwit Research and Consulting LLC - Global Automotive Artificial Intelligence (AI) Market Study 2017-2025

OTA Updates will Power how Future Models of Autonomous Vehicles Learn and Develop

OTA will power how a vehicle's AI "brain" develops

Products like Airbiquity OTAmatic™ will play a critical role in facilitating how automotive AI contines to evolve. Information from car senors, other vehicles, surrounding infrastructure, and more is sent to the cloud for data analytics, and improved algorithms are transmitted back down to the vehicle, updating the code on a continual basis. Being able to update software over-the-air (OTA) also has a wide range of automotive applications and will be integral for cybersecurity protection, edge analytics, and data management.

Airbiquity OTAmatic™