

Automotive Taxonomy Example



Overview

Autonomous systems
Cabin systems
Chassis and body
Complete vehicle systems
Drivetrain
Electrical power systems
Internal combustion
Mobility and connectivity
Safety
Vehicle dynamics



Autonomous systems

ADAS
ADAS components

- Infrared sensors
- Lidar sensors
- Millimetre wave radar (MMW)
- Night vision
- Panoramic and overhead cameras
- Radar sensors
- Rear and parking cameras
- Ultrasonic sensors

Braking and acceleration assistance

- Adaptive cruise control
- Autobraking
- Hill descent control
- Traffic jam assistance

Detection and warning

- Blind spot warning
- Forward anti-collision systems
- Image processing
- Intersection warning
- Lane departure warning
- Lane detection
- Pedestrian detection
- Rear anti-collision systems
- Traffic sign recognition

Driver monitoring

- Active health monitoring
- Driver drowsiness sensors
- Drunk driver monitoring

Parking

- Automatic parking
- Parking assistance
- Parking detection and measurement

Steering assistance

- Advanced trailer assist
- Auto-hitching
- Crosswind stabilisation
- Lane changing assist
- Lane keeping
- Traffic jam assistance

Autonomous modes

- Autonomous activation
- Autonomous de-activation
- Autonomous driving mode
- Autonomous interior change

Automotive Taxonomy Example (cont.)



Cabin systems

Active Noise Control (ANC)

Entry systems

- Biometric vehicle access
- Keyless entry
- HMI

Augmented reality

- Gesture control
- Haptic interfaces
- Head up displays
- Infotainment
- Satellite navigation
- Smartphone integration
- Speech interfaces
- Touch interfaces
- Virtual Reality (VR)

In-car communications

- Automotive bus technologies
- FlexRay
- In-car wifi
- Media oriented systems transport (MOST)
- Optical communications
- Wiring harnesses

Seating

- Power seats
- Seat structures

Semiconductors

Vehicle interior monitoring



Chassis and body

Body in white (BIW)

Body structures

Doors

- Door structures
- Powergate/tailgate actuation

- Side door actuation
- Vehicle door obstacle detection

Suspension

- Active suspension
- Air suspension
- Passive suspension

Wheels and tyres

- Chip to tyre
- Pneumatic tyres
- Run flat tyres
- Tyre pressure monitoring



Complete vehicle systems

Complete vehicle lighting

Forward illumination

- Halogen lights
- High intensity discharge (HiD) lights
- LED lights
- Laser headlights
- Lighting control
- Smart lights

Manufacturing methods

Mountings



Drivetrain

Automatic transmission

- Automatic gearbox
- Continuously variable transmissions (CVT)
- Dual-clutch transmissions
- E-clutch
- Semi-automatic gearbox
- Torque converters

Constant velocity joints

Differentials

Drive shas

Automotive Taxonomy Example (cont.)

Hybrid

- Flywheel energy storage (FES)
- Hybrid electric drive assist
- Parallel hybrid
- Plug-in hybrid (PHEV)
- Power split hybrid transmissions (PST)
- Regenerative braking
- Series hybrid/extended range

Manual transmission

- Clutches
- Flywheels
- Manual gearbox

Transaxle

Transfer boxes



Electrical power systems

Charging and charging equipment

- AC charging
- DC charging
- Handsfree (robotic) charging
- Induction charging

Electric traction motor

Energy management

- Battery management systems (BMS)
- Battery thermal management

Energy storage

- Battery separators
- Lead-acid batteries
- Lithium-ion batteries
- Lithium-oxygen batteries
- Lithium-sulfur batteries
- Metal-air batteries
- Nickel-metal hydride batteries
- Solid state batteries
- Supercapacitors

Fuel cell electric vehicles

- Fuel cell stack
- Hydrogen storage
- Proton Exchange Membrane Fuel Cell (PEMFC)

Stop-start systems



Internal combustion

Cooling systems

Crankshas

Engine structure

- Engine gaskets
- Main bearings

Exhaust

- Diesel particulate filters
- Exhaust systems
- Lean NOX traps
- Oxidation catalysts
- Selective catalytic reduction
- Urea injection

Fuel Pumps

ICE electrics

- Engine management systems
- Generators and alternators
- Power and control systems
- Starter motors

Induction

- Superchargers
- Turbochargers
- Wastegates

Oil filters

Pistons and rings

Pre-chamber combustion systems

Valve train

- Camshas
- Connecting rods
- Exhaust valves
- Inlet valves
- Variable valve li and timing

Variable displacement



Mobility and connectivity

Communication

- Brain to vehicle (B2V)

Automotive Taxonomy Example (cont.)

- Intersection communication
- Vehicle to everything communication (V2X)
- Vehicle to infrastructure communications (V2I)
- Vehicle to pedestrian (V2P)
- Vehicle to vehicle communications (V2V)
- Vehicle to device (V2D)
- Vehicle to grid (V2G)

Cybersecurity

Mobility

- Car sharing
- Fleet management
- Platooning
- Ride sharing
- Usage-based insurance

Remote services

- Live navigation updates
- Over-the-air updates
- Remote diagnostics

- Foundation brakes
- Regenerative braking

Stability

- Dynamic chassis feedback
- Electronic stability control (ESC)
- Traction control system (TCS)

Steering

- Active steering
- Electric power steering
- Four wheel steer (4WS)
- Hydraulic power steering
- Steer by wire
- Steering systems



Safety

Airbags

- Airbag gas generators
- Bumper airbags
- Crash sensors
- Knee and leg airbags
- Passenger airbags
- Rear end collision airbags
- Side impact airbags
- Steering wheel airbags



Vehicle dynamics

Braking

- Anti lock braking (ABS)
- Electronic brakeforce distribution (EBD)
- Electronic brakes