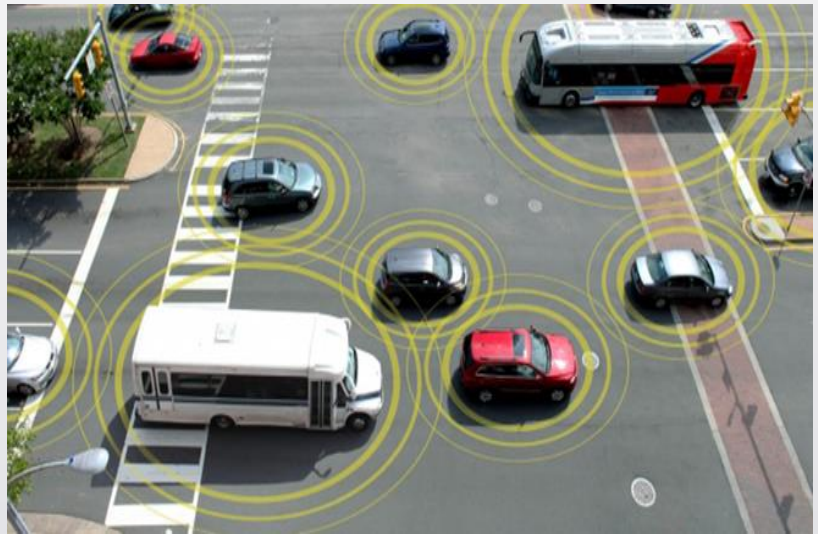# Autonomous Vehicle

COMPUTER LITERACY

KENT STATE

What is an autonomous vehicle?

- **Autonomous vehicle**: a vehicle capable of sensing its environment and navigate without human input

Levels of autonomy

Established by the Society of Automotive Engineers

SAE Level	Name	Narrative Definition	Execution of steering and acceleration/ deceleration	Driving Environment Monitoring	Fallback performance of dynamic driving risk	System capability (Driving Modes)
0	No Automation	Full time performance by human driver	Human driver	Human driver	Human driver	NA
1	Driver Assistance	Driver mode-specific execution by driver assist system	Human driver & system	Human driver	Human driver	Some driving modes
2	Partial Automation	Driver mode-specific execution by one or more driver assist system	System	Human driver	Human driver	Some driving modes
3	Conditional Automation	Driver mode-specific performance by automated driving system	System	System	Human driver	Some driving modes
4	High Automation	Driver mode-specific performance by automated driving system, even if the human does not respond appropriately	System	System	System	Some driving modes
5	Full Automation	Full time performance by automated driving system	System	System	System	All driving modes

Source: SAE International

Dangers of autonomous driving

- Trolley problem as an ethical dilemma

- **Driver override systems**: when the car actively ignores driver's commands

- Weaponized vehicles

- Life threatening situations could arise from

  - Computer malfunction

  - Imperfect GPS causes wrong-turn

  - Lanes distorted by weather

- Driver attention decreases

Future and possible impact of autonomous driving

- Less traffic collisions

- Less traffic congestion

- Higher speed limits

- Less expensive car insurance

- Parking lots moved further away

- Commute time becomes free time

- Smarter infrastructure (road signs, traffic lights, lanes…)

- Mobility as a service

- Liability and other legislation

- Decrease in jobs (public transportation, truck drivers, diners, toll-booths)

Other automotive technologies

Biometric Vehicle Access

Recognition systems include

- Fingerprint
- Facial
- Voice
- Iris

Active Window Displays

Head up displays
Designed by the military for accessing quick glance information while driving.

Remote Vehicle Shutdown

- Can be used by truck drivers, taxi cabs, other companies if a unit is under suspicion
  - Example: TrackNStop
  - http://www.tracknstop.com/

- Can also be used by bad actors
  - https://www.youtube.com/watch?v=MK0SrxBC1xs