

# Introduction to Longitudinal Control Of A Vehicle



# Overview

- Longitudinal Control in A Manual Car.
- Longitudinal Control in An Actual SDC.
- Longitudinal Control in Our Model.

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# Overview

- Longitudinal Control in A Manual Car
- Observation
- Control
- Traffic example
- Longitudinal Control in An actual SDC
- Longitudinal Control in Our Model

# Overview

- Observation Of A Manual Car



# Overview

- Longitudinal Control in A Manual Car
  - Observation
  - **Control**
  - Traffic example
- Longitudinal Control in An actual SDC
- Longitudinal Control in Our Model

# Overview

- Control Of A Manual Car



# Overview

- Longitudinal Control in A Manual Car
  - Observation
  - Control
- Example of Manual LC
- Longitudinal Control in An actual SDC
- Longitudinal Control in Our Model



# Overview

- Longitudinal Control Of A Manual Car





# Overview

- Longitudinal Control in A Manual Car
- Longitudinal Control in An Actual SDC
- Hardware
- Techniques
- Examples
- Longitudinal Control in Our Model

- LiDAR
- RADAR
- Vision

# Overview

- Longitudinal Control in An Actual SDC

Name	Purpose
LiDAR - Light Detection and Ranging	Creates a 3D light image that lets the car judge unevenness of the road.
RADAR - Radio Detection and Ranging	Sends radio signal to detect any objects in the way to reduce speed or sometimes stop the vehicle.
Vision	Detect obstacles and objects (person or bicycles) in the way of the vehicle from a stream of images in real-time.
Accelerometer	Measures the linear velocity of a moving object.

# Overview

- Longitudinal Control in a Manual Car
- Longitudinal Control in an Actual SDC
- Hardware
- Techniques
- Examples
- Longitudinal Control in Our Model

- Intelligent Driver Model
- Adaptive Cruise Control

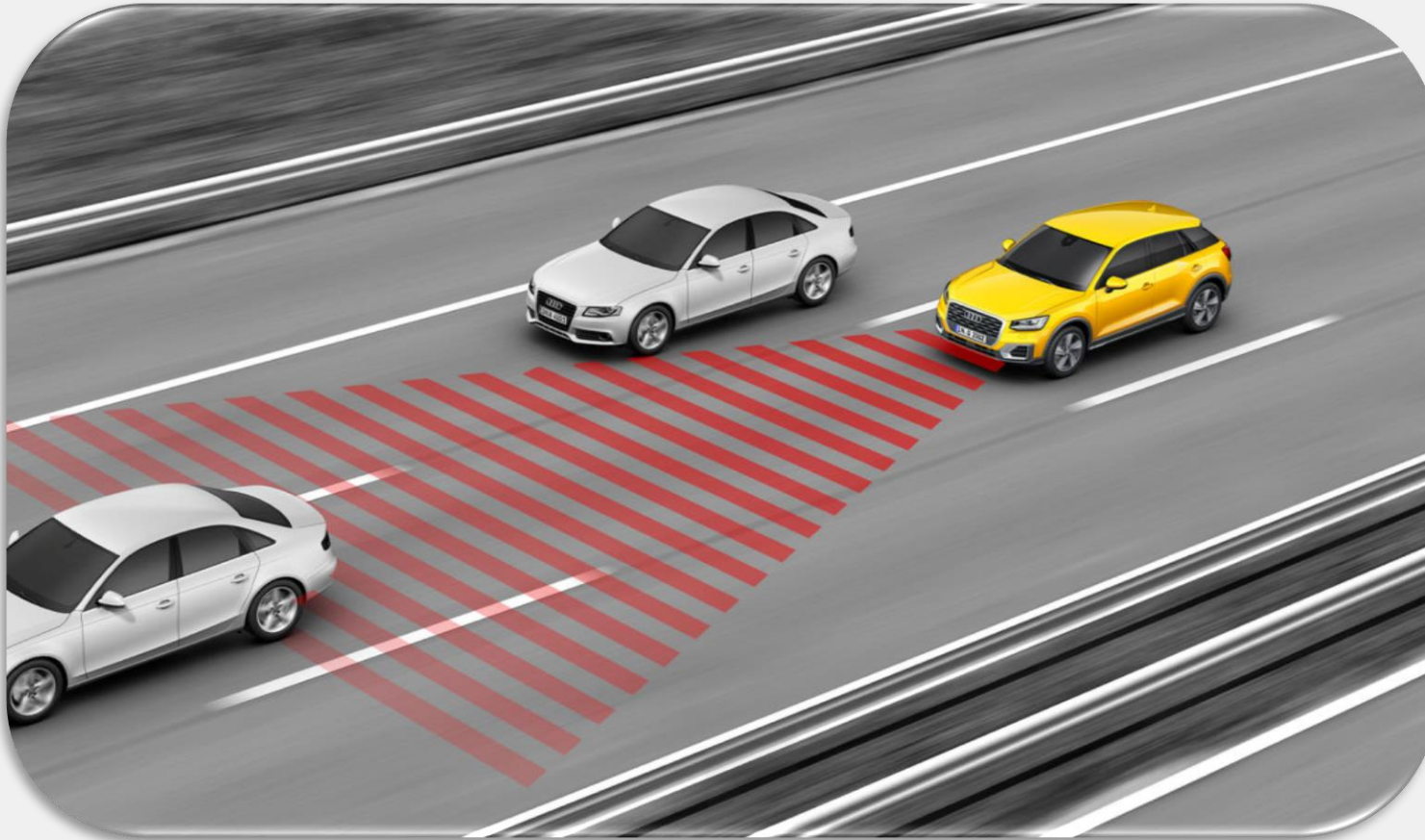
# Overview

- Intelligent Driver Model



# Overview

- Adaptive Cruise Control



# Overview

- Longitudinal Control in a Manual Car
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- Hardware
- Techniques
- Examples
- Longitudinal Control in Our Model

- Jack the Audi, “high level 3”
- Tesla Version 9 FSD – Full self-driving – “True mind’s eye of the neural net”



# Overview

- Jack the Audi





# Overview

- Tesla Version 9 FSD



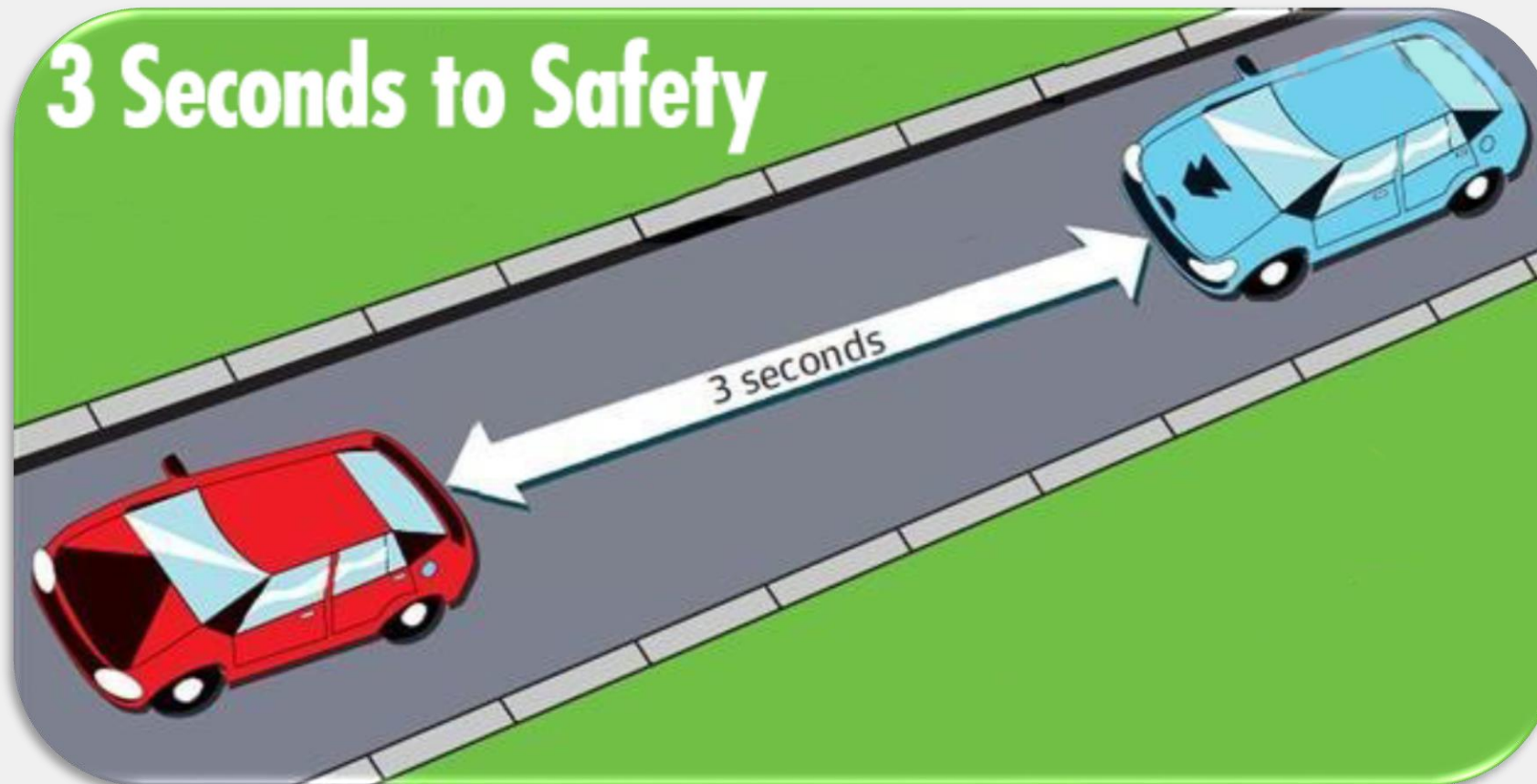
# Overview

- Longitudinal Control in a Manual Car
- Longitudinal Control in An Actual SDC
  - Hardware
  - Techniques
  - Examples
- Longitudinal Control in Our Model

- Speed Control
- Distance Maintenance

# Overview

- Speed Control and Distance Maintenance



**Thank You**