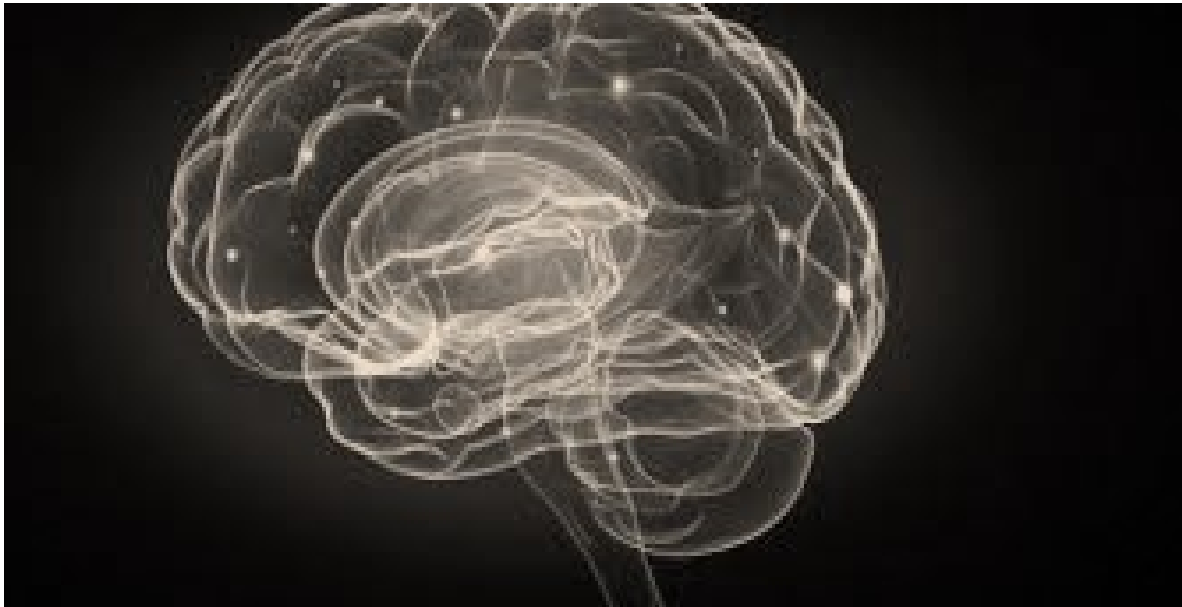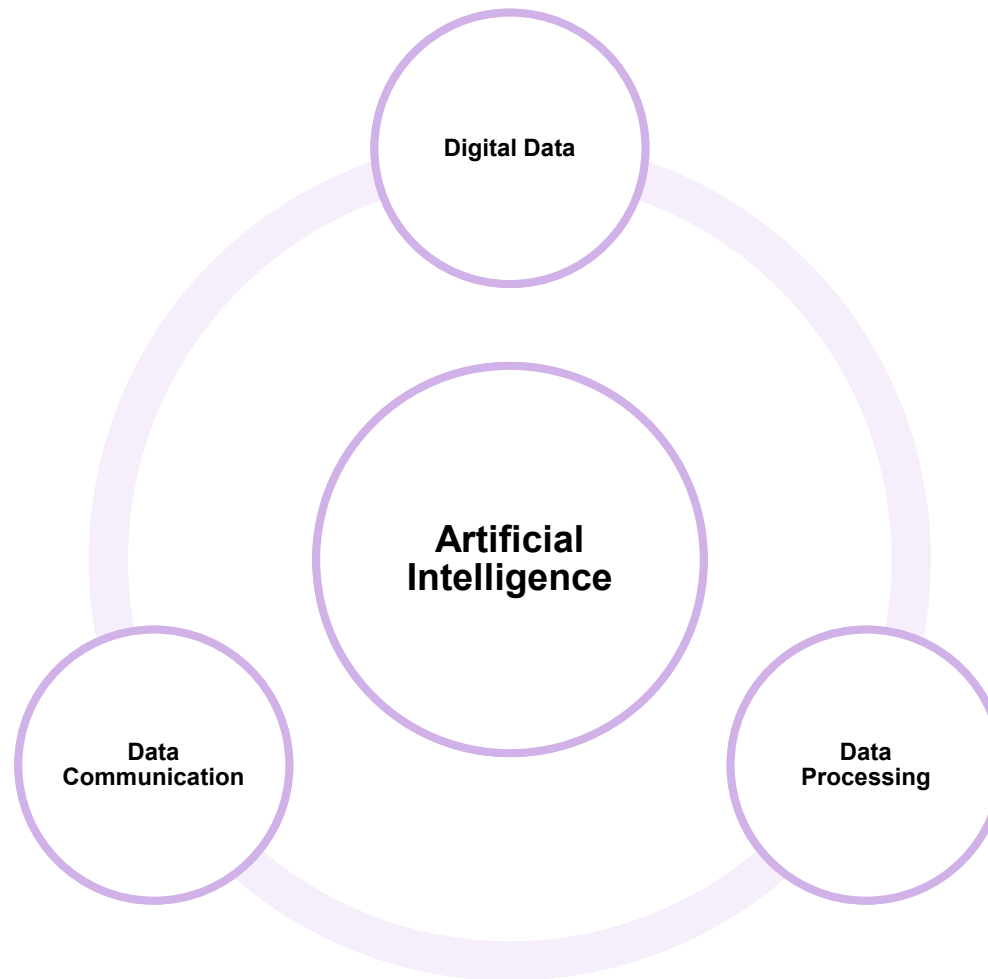# Artificial Intelligence for Automotive

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Giornata AIRI per l'Innovazione Industriale 2019

Milan - May 16th, 2019
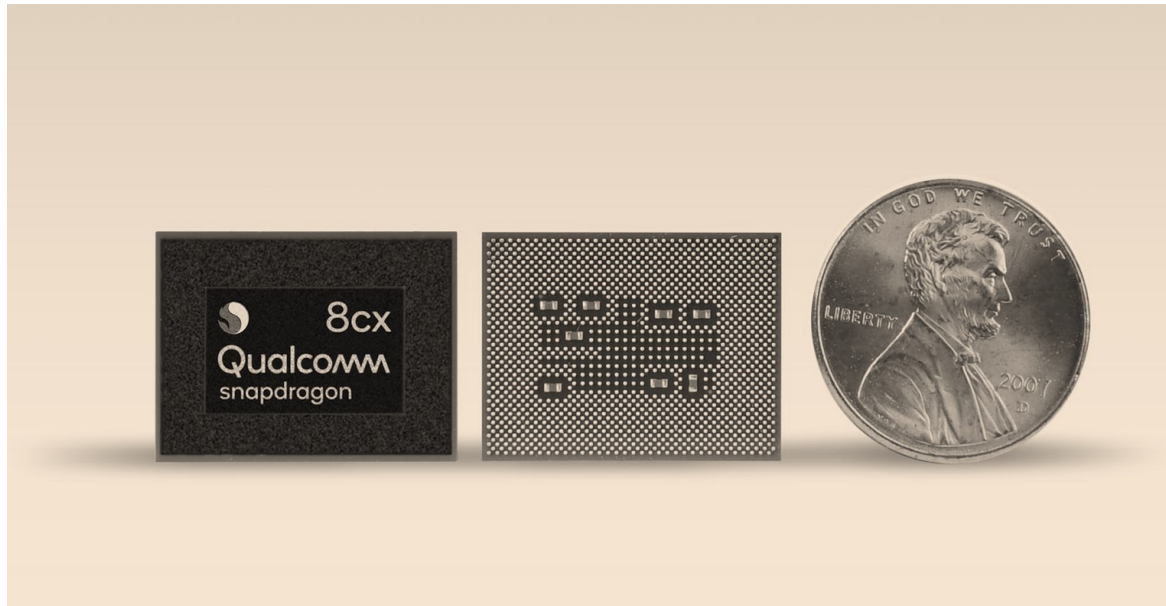
Human Brain can storage up to 100 million Books

ARTIFICIAL INTELLIGENCE

from '80s massive Computer penetration to the "Cookies" Era

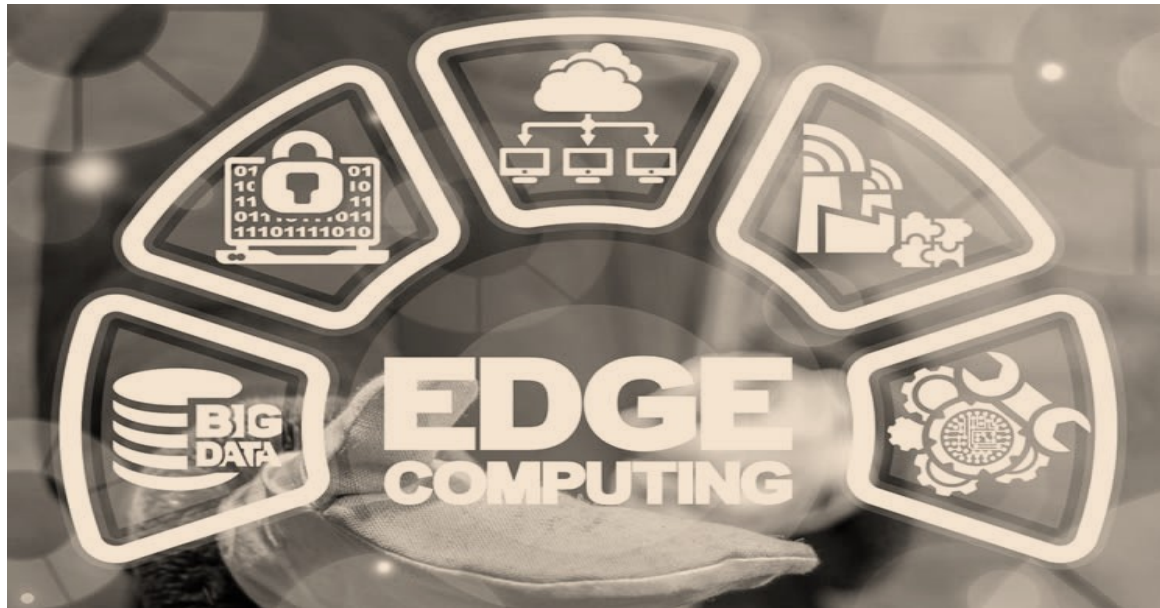**Digital Transformation is not only Digital Data.**

**embrace the Digital Transformation
by owning Digital Platforms.**

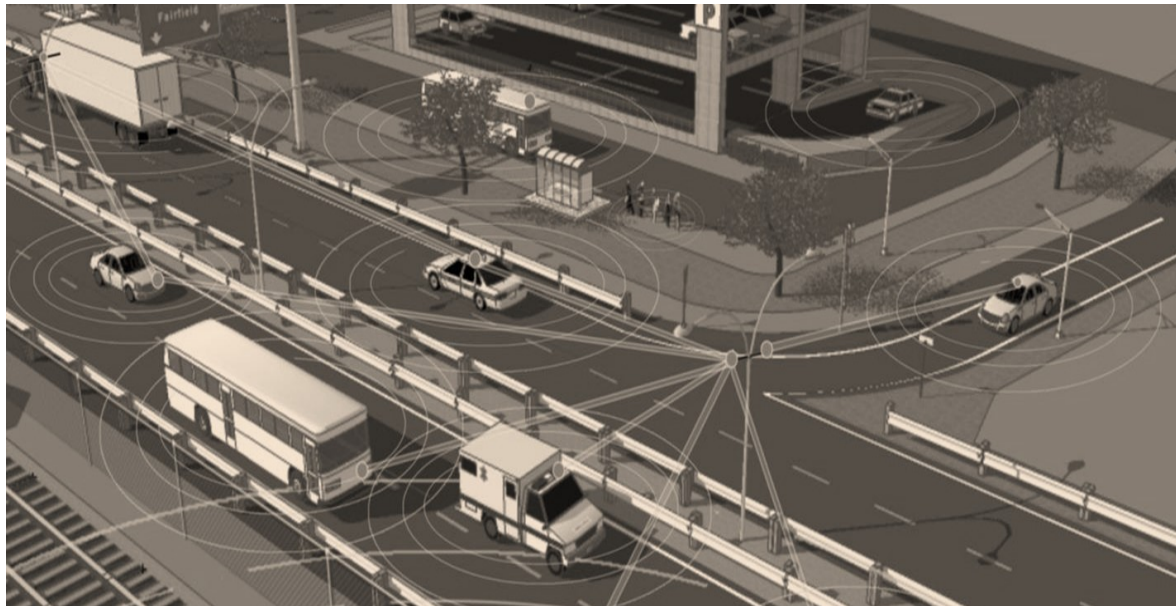**Smart Cities will increase the proliferation of Digital Data.**

Every year the number of transistors produced is twice the number of transistors produced in previous years
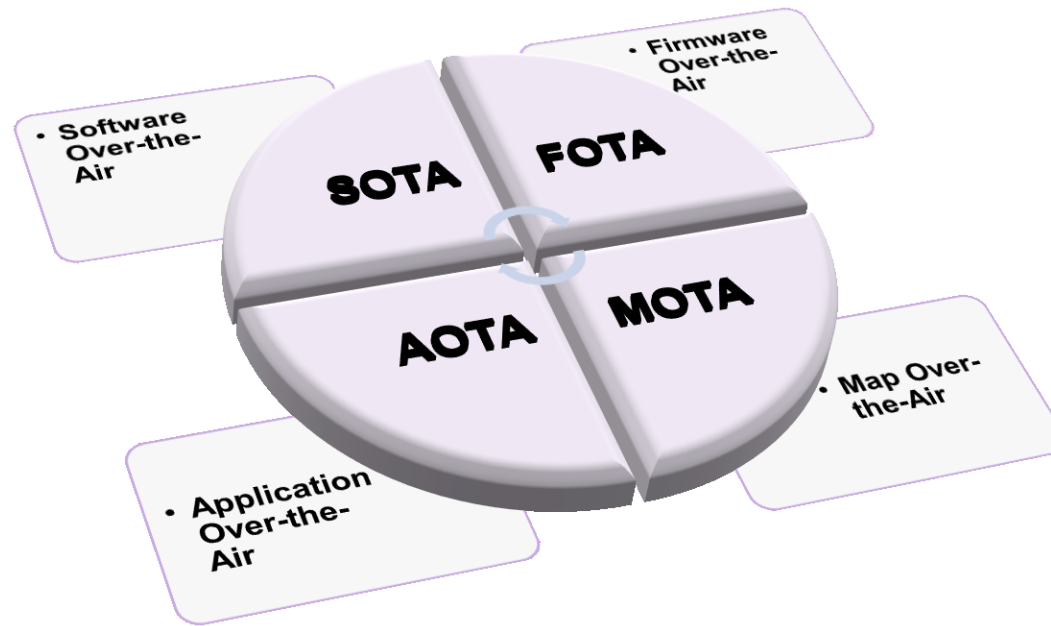
Connectivity Technologies into the car will enable Hybrid Digital Platforms with higher storage and computational capabilities.

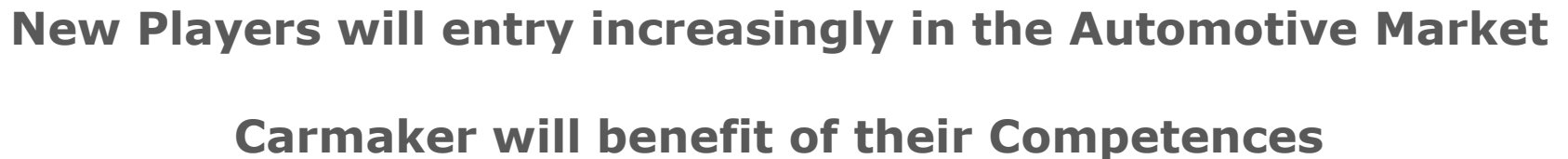**Connected Car conveys Digital Data**

**it becomes a node of Digital Network and
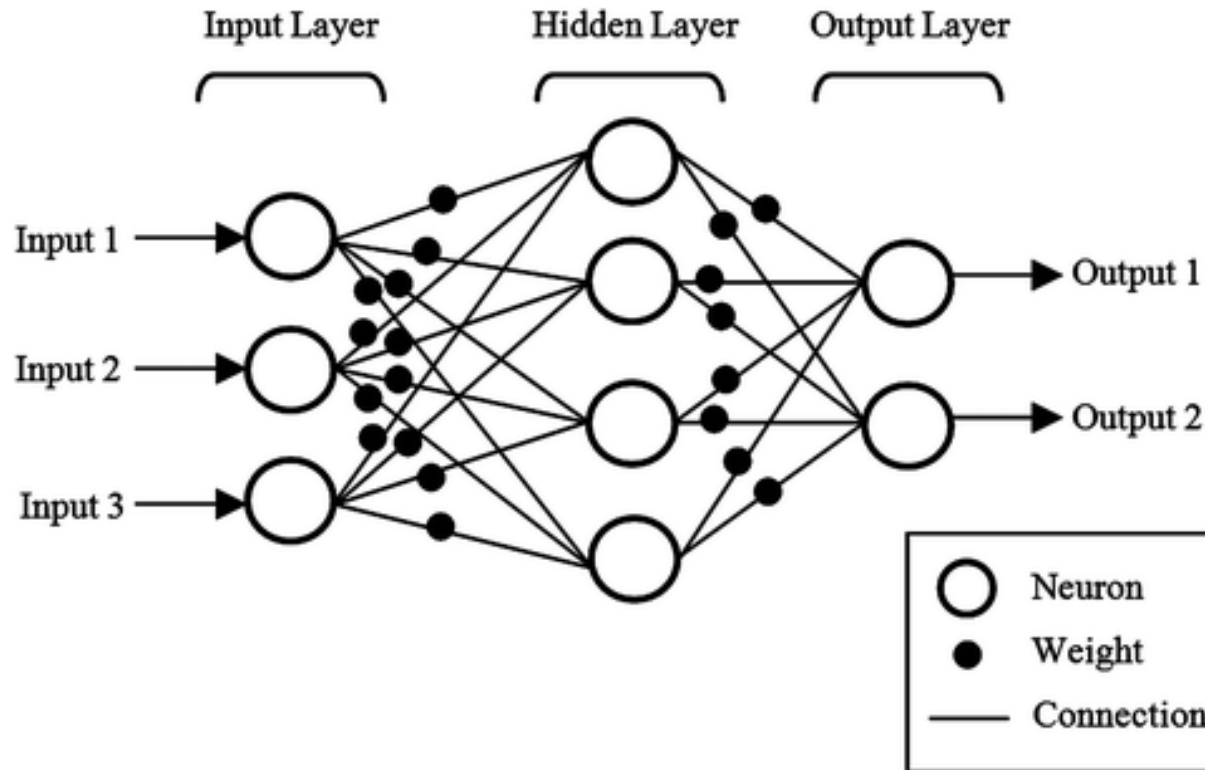will enable Services among Verticals.**

**Connectivity is an enabler of
Dynamic and Up-to-Date Information.**

DIGITAL DATA TRENDS IN AUTOMOTIVE

DIGITAL SOURCES IN THE CAR BUYING PROCESS

DATA SECURITY AND PROTECTION

MOBILITY AS A SERVICE

AUTONOMOUS DRIVING

PREDICTIVE MAINTENANCE

CONNECTED SUPPLY CHAIN & IMPROVED MANUFACTURING

Source: Forbes, FUTURUM

New Players will entry increasingly in the Automotive Market

Carmaker will benefit of their Competences
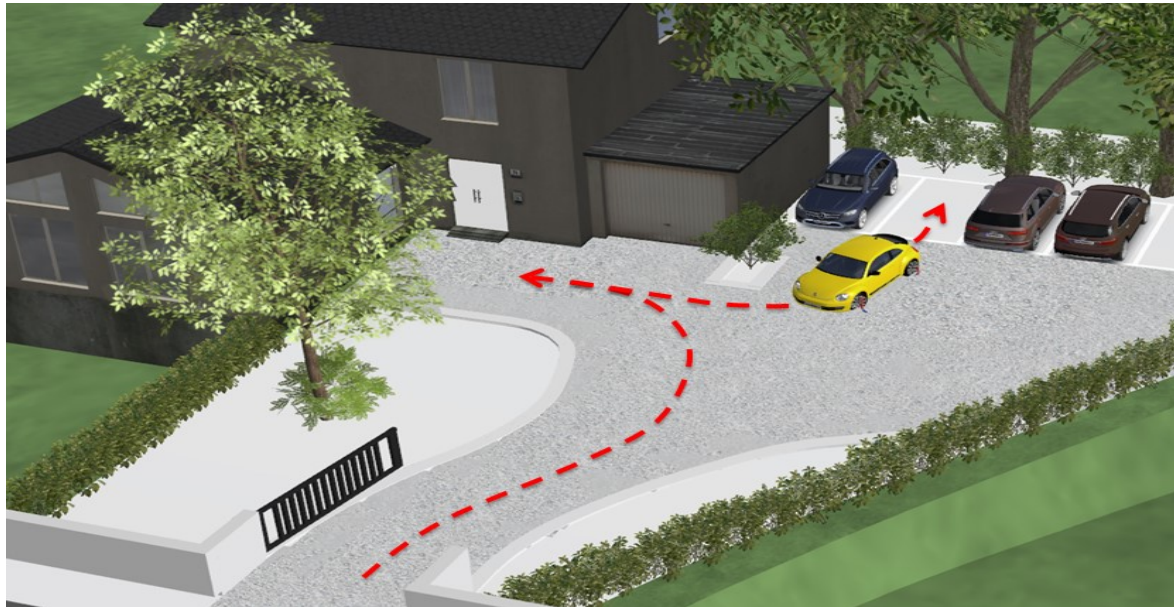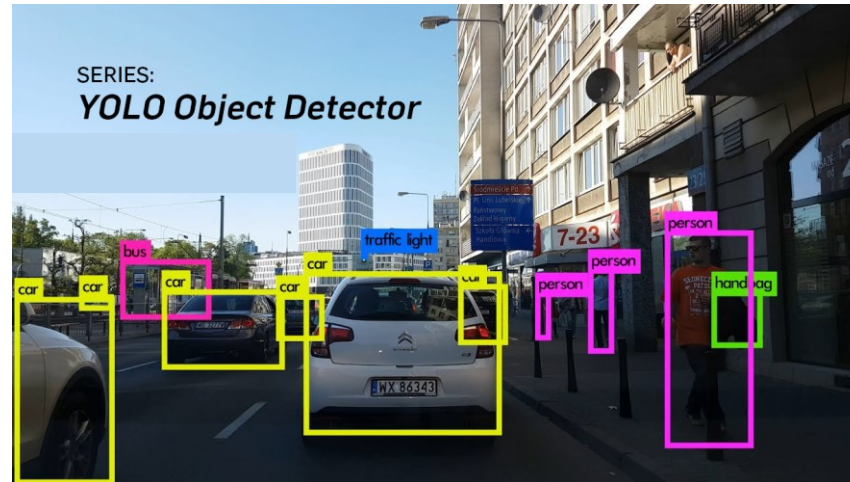
Neural Networks are structured with an architecture that has similarities with the structure of the cerebral cortex

the application of electronics in cars forces designers to face both the growing complexity of systems and the rapid technological evolution
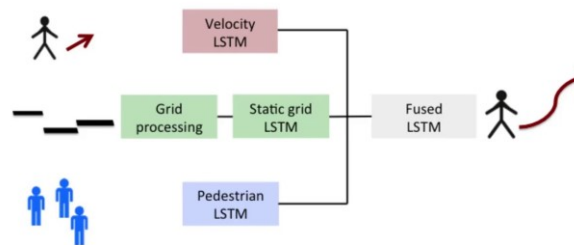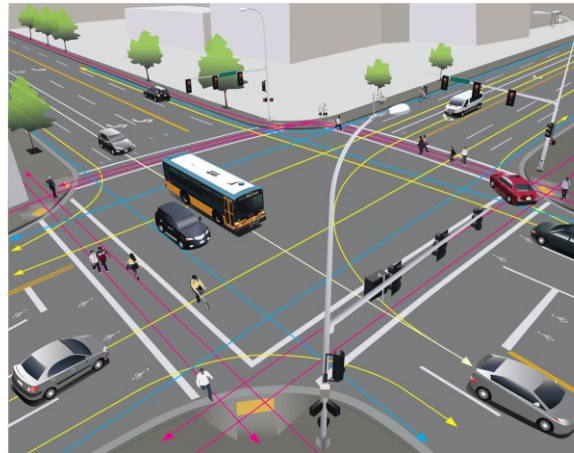
You Only Look Once

Semantic segmentation
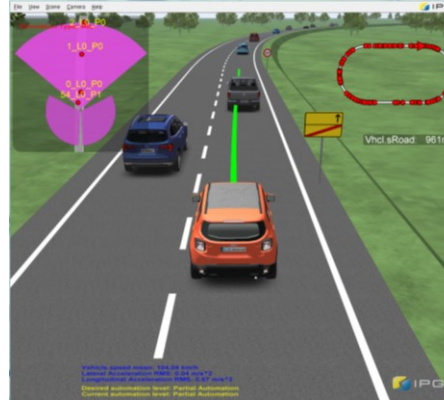
© Authors of ICRA 2018 Paper 922   Thu AM   Pod K.5
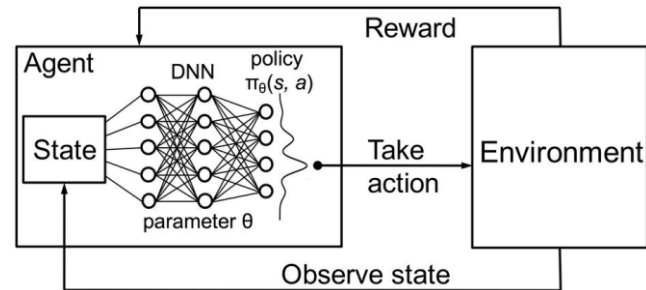
Neural Networks can be used for behavioral predictions of vehicles and pedestrians
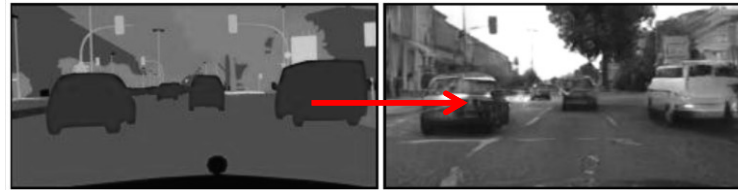
Vehicle motion & environment simulation

Deep reinforcement learning scheme

**Accurate vehicle motion & environment simulation plays
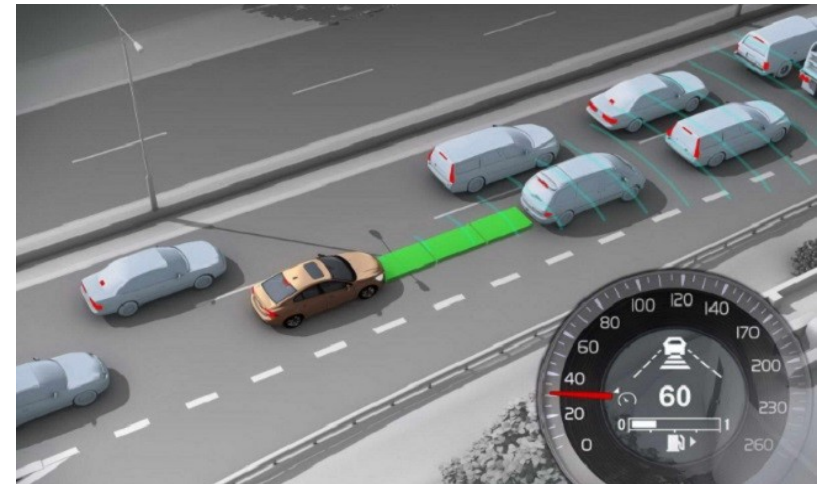a crucial role especially in the early stages**

Paired image to image translation

Unpaired image to image translation

Neural Networks are extremely eager of data

several Functionalities can be customized/personalized for a better user experience

PREDICTIVE MAINTENANCE

Data Sources for Predictive Maintenance

Vehicle Sensor Data

VIN
Timestamp
DTC Code
Odometer
Speed
Acceleration
Engine Temperature
Engine Torque GPS
Coordinates
etc.

Vehicle Repairs Data

VIN
Date vehicle in
Date vehicle out
Repair code
Parts replaced
Warranty claims
Repair Comments

availability of vehicle sensors and repair data can be used to train Neural Networks

Artificial Intelligence will play a relevant role for the Automotive trends.

Automotive domains can capitalize the increasing amount of data availability. For instance in the automated driving, AI can enable reliable and real time object detection in complex scenario.

Hardware platform and vehicle architecture need to be upgraded accordingly to guarantee the processing power, storage capability and communication requirements.

THANK YOU

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