

# Autonomous car or connected car ?

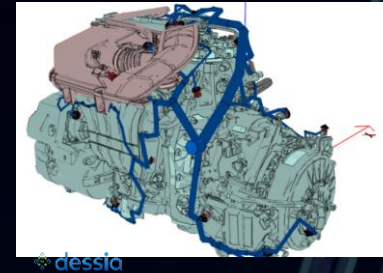
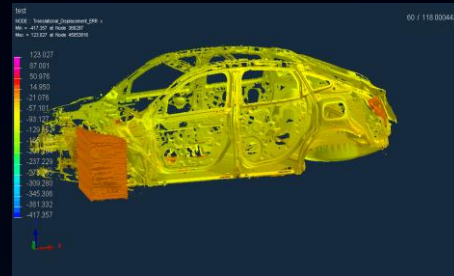
Rodolphe Gelin, Lead Expert Artificial Intelligence  
Ampere, Renault Group



# Two aspects of AI @ Renault

## Improvement of the operational performance

- Better and faster engineering, manufacturing, sales, supply chain, after-sales



## « Humanized » the car

- Use AI and other advanced technologies to improve the quality of the relationship between the users and the car
- My car knows me - My car protects me - My car enhances my sensations - My car surprises me - My car learns.
- Role of AI
  - Connectionist AI to understand the outside context and the inside situation
  - Symbolic AI to decide the relevant action





# AI in the car : Driving Assistance

## Scene understanding

- Reconstruct the scene around the vehicle
- Provide an accurate representation to the driver
- Anticipate the movements of other vehicles



## Adjust the behavior of the vehicle

- Emergency braking
- Adaptative cruise control
- Lane following

## Coaching

- Hybrid vehicle journey optimization
- Electric Road planner
- Safety coach
- Car use optimization



# AI in the car : Enhanced User Experience

## Hyper personalized and contextualized content

- Center of interest
- Driving conditions

## New kind of interaction

- Expressive voice
- Message style

## Driver's knowledge

- Preference settings
- Preference collecting (social networks...)
- Preference guessing (driver habit learning)

Under  
Driver's decision





# Embedded, Edge or Cloud ?

## Embedded

- Real/Interactive time
- Service continuity
- **Constrained development**
- **Expensive hardware**

## Edge

- Embedded extra computing power (phone or dedicated box...)
- Interactive time
- Service continuity
- Less constrained development
- **System complexity**

## Cloud

- “Unlimited” computation power
- Remote services access
- **Latency**
- **Network dependency**
- **Privacy**

“Autonomous” car



“Connected” car

# The Software Defined Vehicle (SDV)

## Computer on wheels

- Centralized architecture
- GB/s Internal network
- 5G offboard communication
- More computing power
- More connected devices and sensors (cameras, radars,...)

## New software framework

- Dedicated CAR OS
- Software update over the air
- Cybersecurity by design

