5G-CAR

5G car-to-everything, communication systems for smart and safe transport in Emilia-Romagna.

19/11/2020

Ing. Giacomo Soprani

Partners

Developing partners

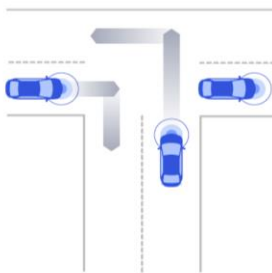### Stakeholders

C-V2X
Cellular Vehicle-to-Everything

wikipedia

Intention/trajectory sharing for autonomous driving
Providing higher level of predictability and traffic efficiency for advanced path planning
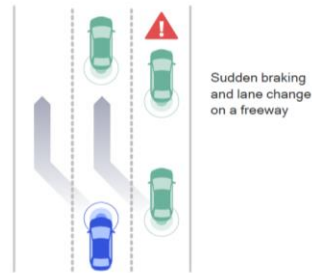
Efficient maneuvers
Autonomous vehicles are able to make quicker, yet safe maneuvers by knowing the planned movements of surrounding vehicles
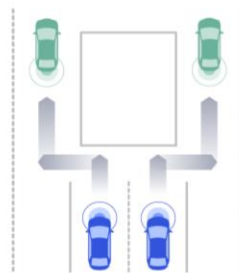
Advanced path planning
Supporting the level of predictability needed for advanced path planning for autonomous driving

Sudden braking and lane change on a freeway

Coordinated driving
Autonomous vehicles are able to choose time-efficient paths toward their given destinations as they know the planned movements of other vehicles

qualcomm

5G - PROS and CONS

PROS

- ➢ theoretical speed of up to 10/20 Gbps (up to 100 times faster than 4G)

- ➢ high-bandwidth (higher than 4G)

- ➢ low latency, less than 5 millisecond (~10 times less than 4G)

- ➢ Density of devices (~100 times increase in traffic capacity, more than 4G)

- ➢ Reduced power consumption (~10% less than 4G)

- ➢ Cost of establishment (replace the existing infrastructures)

- ➢ It's still under development (not ready for the market)

- ➢ Limited converage (more cells required)

- ➢ Overcrowded Radio Frequency (3G,4G and other)

- ➢ Different spectrum allocation in different Countries

CONS

ART-ER
ATTRATTIVITÀ RICERCA TERRITORIO

POR FESR EMILIA-ROMAGNA 2014/2020

Regione Emilia-Romagna

Project targets

Theoretical project targets

- ➤ Road safety
- ➤ Driver assistance
- ➤ Full automation
- ➤ Energy saving

- ➤ Realization of a validated prototype in a simulative environment TRL6. Connect a vehicle (an ambulance in this case) with the surrounding environment

- ➤ A display that shows warnings, alerts, realtime video and traffic that will help the driver to cross the intersections between him and the crash site in the fastest and secure way.

- ➤ Merge the visible and infrared images to improve the driver visibility (fog, night)

Physical project targets

Effects on the production chain

This project involves the whole mechatronic production chain of Emilia Romagna.

Starting from the clean room located inside CNR in Bologna

Developing of the electronic boards and antenna

Assembling the prototypes

Testing the prototypes directly on the field together with the stakeholders

THANK YOU

If you would like more information, please contact us at info@redoxprogetti.it or info@5g-car.it

https://5g-car.it/