

5G Remote Automated Driving

Panel II – Connectivity and Trends

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Challenges faced by industries





Repetitive actions, decrease of productivity because of time wastage activities.





People needing to do hazardous tasks and increased errors associated with manual handling.



Limited working hours, production breaks due to workers' availability.

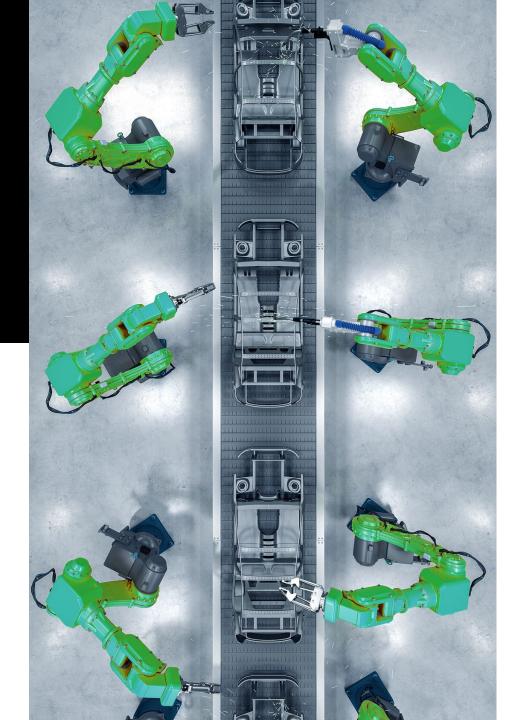


Is our solution ready for elevating all industries and sectors for Industry 4.0?

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Our Solution

It is a cloud-based solution for automating processes by driving vehicles around in dynamic environments





Adaptable to the customers, fits any layout and setup, and is tailored to any use case requirements



Dynamic environments are no trouble for the solution, that can monitor everything in real time and drive the vehicles efficiently Automated storage/retrieval system (AS/RS)



Complex implementation



High initial cost



Limited flexibility

Automated Guided Vehicles (AGV)



Fixed routes



High infrastructure requirements



Limited flexibility

Autonomous Mobile Robots (AMR)



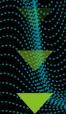
High initial cost



Retrofitting challenges



Navigation issues



We cover the gaps of the current solutions and joint the best of all solutions

56 Remote Automated Driving



Flexibility



Scalability



Adaptability



Customization



Efficiency



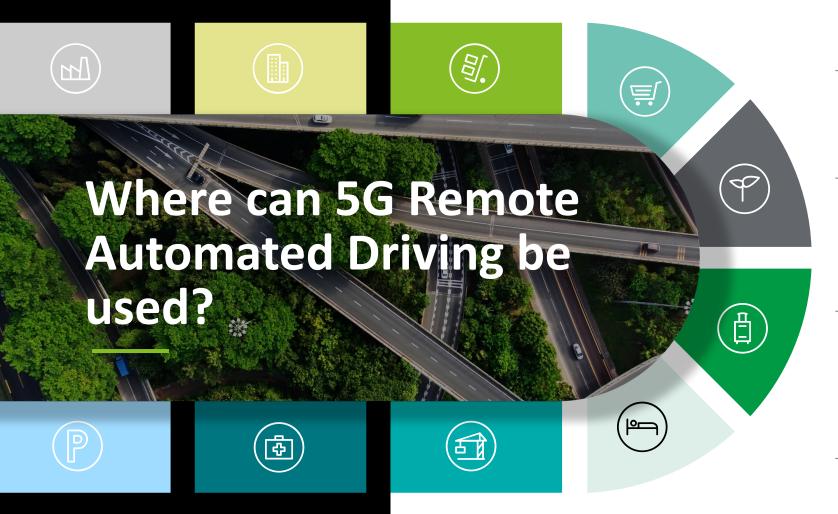
Reliability



Security



Cost optimization





- Transport of materials
- Transport of products



Terminals

- Transport of luggage
- Transport of materials



Office spaces

Transport of materials



Warehouses

- Transport of packages
- Transport of pallet



Retail

- Stock management
- Transport of pallets
- Transport of products
- Automatic shopping



Agriculture fields

- Transport of products
- Treatment application
- Product inspection



- Room services
- Transport of goods



Extraction or construction sites

- Transport of materials
- Difficult access inspections



Hospital units

- Transport of food
- Transport of medicine
- Automated wheelchairs
- Automated stretchers



Parking & Garages

Automated valet parking

5G Remote Automated Driving solution includes support, 5G and sensoring hardware setup and a core cloud native software solution to manage and monitor all vehicles

Software with open-source frameworks like Angular, Java + Spring, Python, hosted in any cloud, with laaC using Terraform.

Manage traffic rules and pathing rules like velocity, blocked areas, traffic lights, preferred roads, etc

Manage slots, geofences and any parking layouts

Real time environment recognition and tracking of all the objects in the controlled space

Drive tracking of all controlled vehicles and possibility of intervening manually on the drives whenever it is needed;

















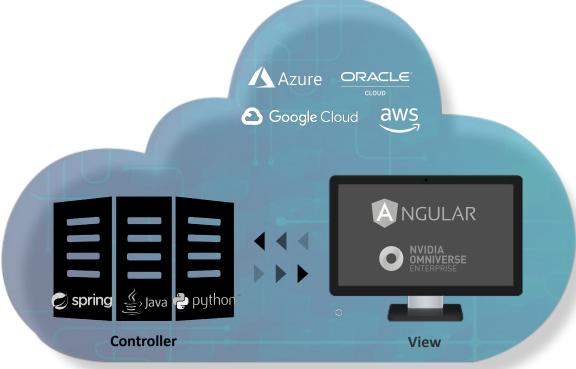












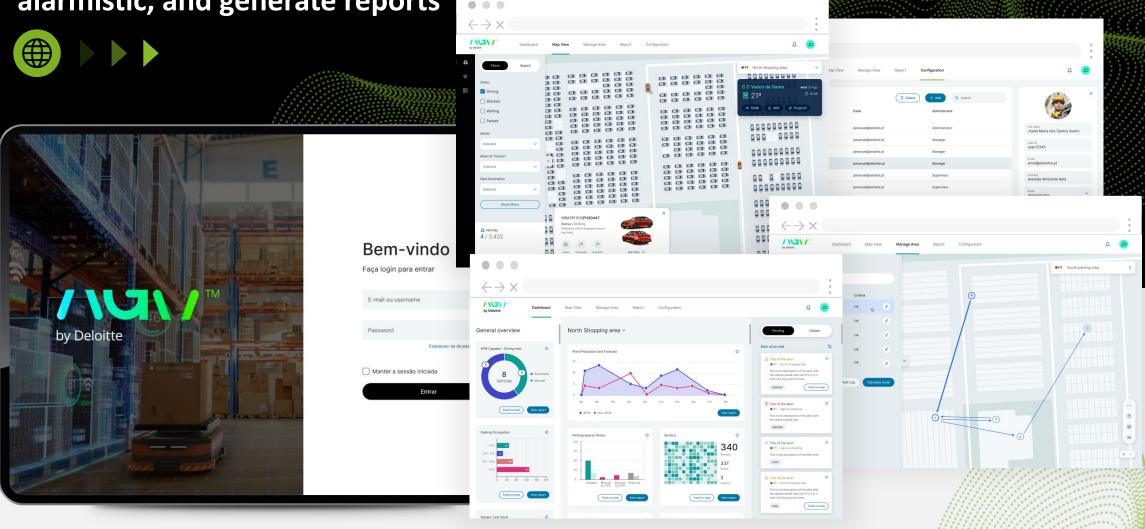
Hardware with LiDAR sensors, **CCTV HD cameras**





Sensors & Cameras

Visualize dashboards and metrics, monitor driving and act on alarmistic, and generate reports



The capabilities of the system can be experienced in a 3D live demo

Multiple types of vehicles will be in action, showcasing the agnostic driving capabilities of the solution



The entire demo space is tracked by **sensors** and cameras, creating a real time representation of the environment



Spread around the maquette, there will be **3D props** that represent a dynamic environment



01

Vehicle **registration** is initiated when placed on a **geofence**, simulating the end of a production line

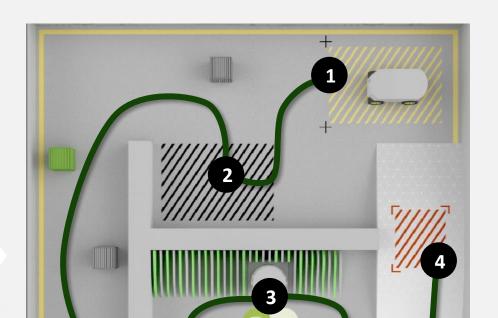
02

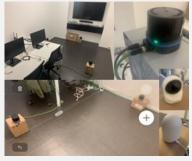
Vehicle **drives** to a first designated **stop and does** a road test 03

Vehicle **drives** to a second designated stop, **avoiding obstacles** in the way and does an electric checkup

04

Vehicle **drives** to the last stop and is parked, **finalizing** its route









Delivering the 5G enabled digital transformation for Automotive Sector

Advanced connectivity for Automated Driving, vehicle control and maneuver around an automotive OEM production plant without requiring a driver

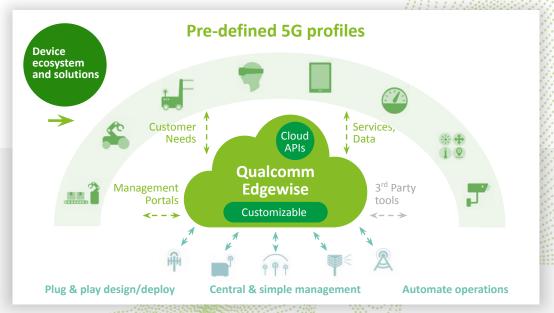
powered by Wavecom

5G Advanced connectivity powered by CISCO

Automated networks powered by Qualcomm



Deloitte and Qualcomm are partnering to bring simplified, centralized and automated network management and operations solutions to life...



5G Remote Automated Driving at MWC 2024



CORE 5G SA
@ Lisboa



5G Spectrum band N77 (3,9-4.0GHz)



RAN & Devices @ Barcelona



Internet External Access

Deloitte Booth was coverage with a **5G Private Network** to support all real Demos

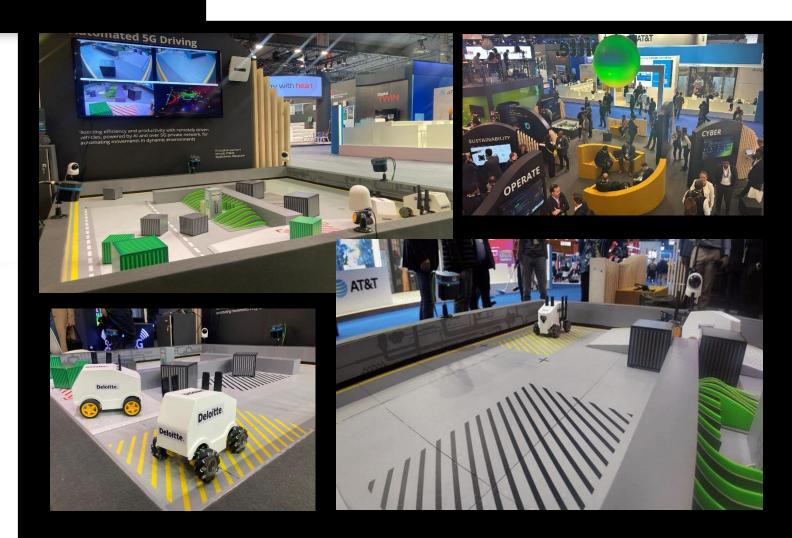


Remote Automated Drive Vehicle showcasing the agnostic driving capabilities of the solution with sensors and cameras.













Infrastructure

vehicle

& parking

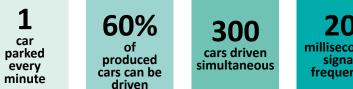
- Distribution parking
- Sensor calibration

car

- Charging stations
- Load parking

Distribution parking

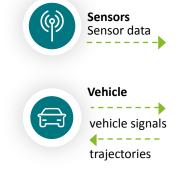
Test Maneuvering



20 milliseconds signal frequency

3.5 50.000 messages every minute **Gb** of data per hour per car per car

33.84



movement

tracking



Monitor

& Control

♠ map information

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Where was this already done?

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DONE

Private network setup

Hardware acquisition (vehicles, sensors and cameras)

Vehicle communication Live tracking of objects

Al models for vehicle maneuvering

Middleware for all types of vehicles

Object identification and movement prediction

Cloud infrastructure setup

IN PROGRESS



Traffic rules

Path optimization

Digital twin simulations



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