Continental
The Future in Motion

Application of Artificial Intelligence in Automotive Industry

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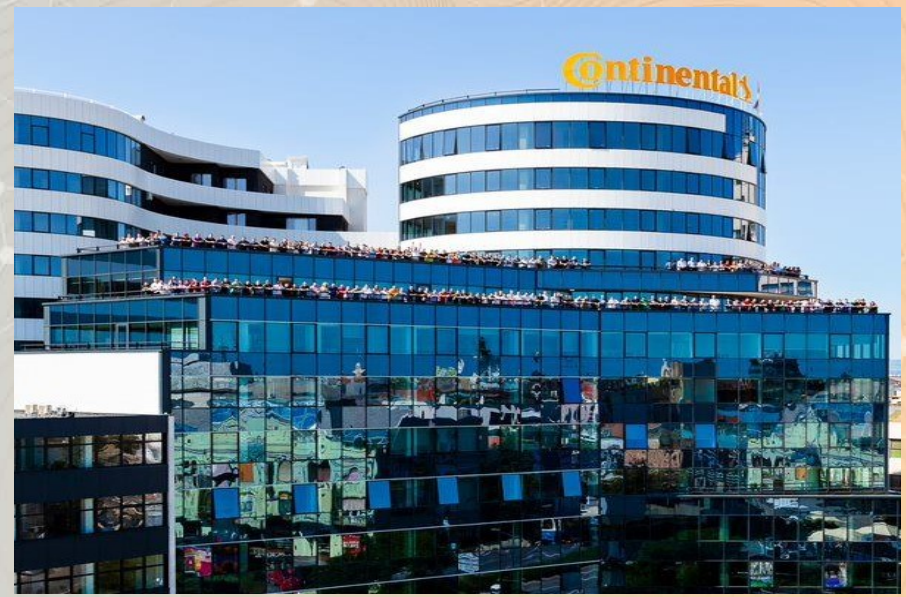
Continental's AI contribution

1. Artificial intelligence in Serbia
2. Interior Solutions
3. ADAS Solutions
4. Self Driving Cars
5. Smart cities of the future

Serbia is developing an AI strategy

- Serbia, one of the 20 countries worldwide to have an AI strategy, has 5 targets to be achieved:
  - develop the AI R&D segment
  - develop the economy segments where AI is a key competence
  - adopt AI in the public services
  - enable development of AI trough infrastructure, education, data availability
  - ethical and safe use of AI
- Continental is part of the working group



- In Continental Automotive Novi Sad few teams in CVS, out of 400 highly specialized engineers work on:
  - Automated driving (SAE level 3 and above)
  - Advanced radar systems, front looking radar
  - Geometric computer vision for front looking cameras

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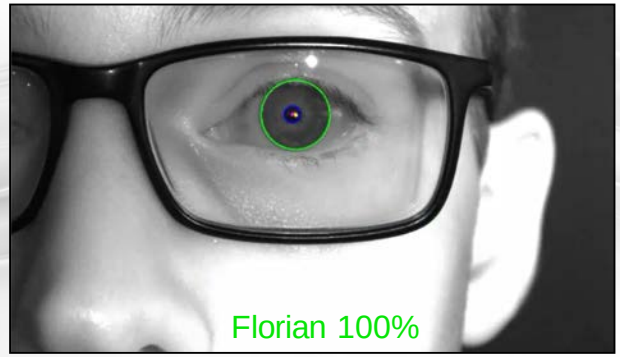
Interior solutions: your car knows you.

Develop biometrics algorithms for authentication and access control

Task: recognize and authenticate users.



Focus on:

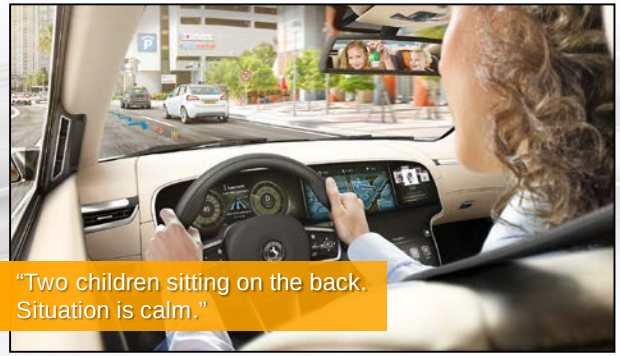
- Automotive Interior Camera
- Infrared Illumination
- Embedded, low computing power hardware
- Recognition on the fly
- Robustness against spoofing
- Fusion of different biometrics algorithms to enhance security and robustness

Image Capture & Preprocessing	Segmentation	Feature Extraction	Matching
Infrared, gamma correction and rescaling	Iris, Pupil, Eyelids detection	Iris Info into small Binary Phase Matrix	Bitwise comparison with stored Matrices

Interior solutions: your car perceives you.

Develop algorithms capable to capture and interpret situation and activities.

Task: use various sensor data to record and interpret what happens in vehicle's interior.



Focus on:

- Interior Sensors (e.g., camera and audio sensors)
- Embedded, low computing power hardware
- Extend from driver monitoring to cabin and occupants monitoring
- Complement image-based approaches with e.g. audio-based approaches

	Image and Audio Capture & Preprocessing	**Segmentation** Object recognition and classification	**Situation Analysis and Activity Mining**	

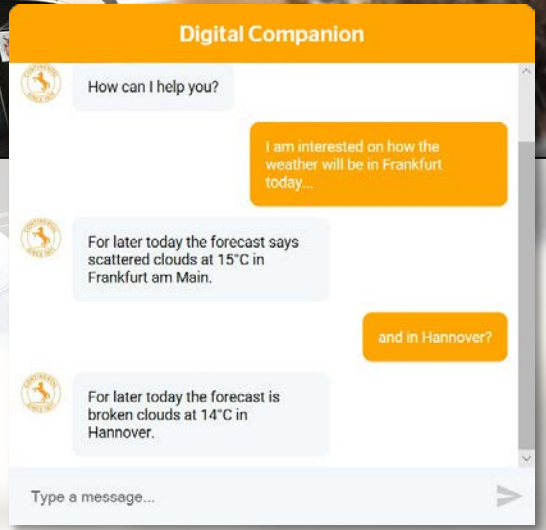
Interior sol.: your car acts and reacts to your needs and preferences.

Enhance the Digital Companion with AI-based features.

Digital Companion

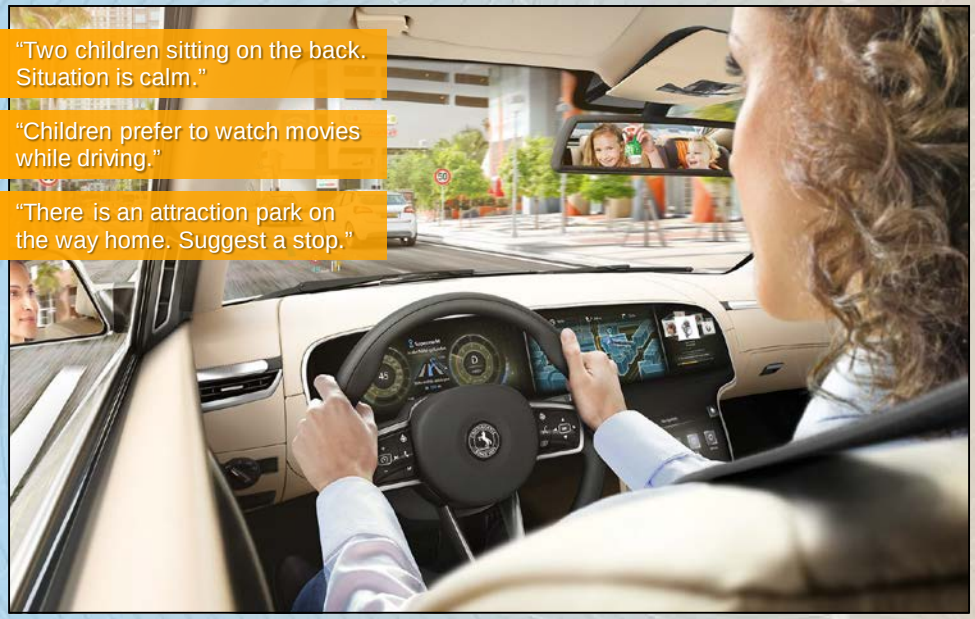
- Enable the transition from a pure Voice Assistant for navigation purposes to a Digital Companion for all mobility-related situations.
- Extract the meaning of the conversation via natural language understanding techniques.
- Respond to the extracted content via natural language generating techniques.

- Safe and intuitive human-machine interaction – reduce distraction making driving even safer
- Private data and vehicle data are securely protected



Interior sol.: your car acts and reacts to your needs and preferences

Adapt routes and offers based on the individual preferences of occupants.



- Combine user identification with preference learning to adapt and personalize offers while being driven.
- Learn and associate preferences to user profiles.
- Ease the human-machine interaction by making offers which match the current driving context.

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SAE Levels of Driving Automation

‘Vehicle supports the driver.
Driver must monitor the system at all times.’

Driver Only

Level 0
Driver Only

Assistant

Level 1
Assisted

Assistant

Level 2
Partial Automation

Chauffeur

Level 3
Conditional Automation

Chauffeur

Level 4*
High Automation

Robot

Level 5
Full Automation

* ***machine is fallback***

‘Vehicle performs driving functions partially or fully.’

ADAS Product Portfolio

ASS./AUT. DRIVING CONTROL UNIT

eHorizon cloud services

CAMERA (opt. LIDAR)

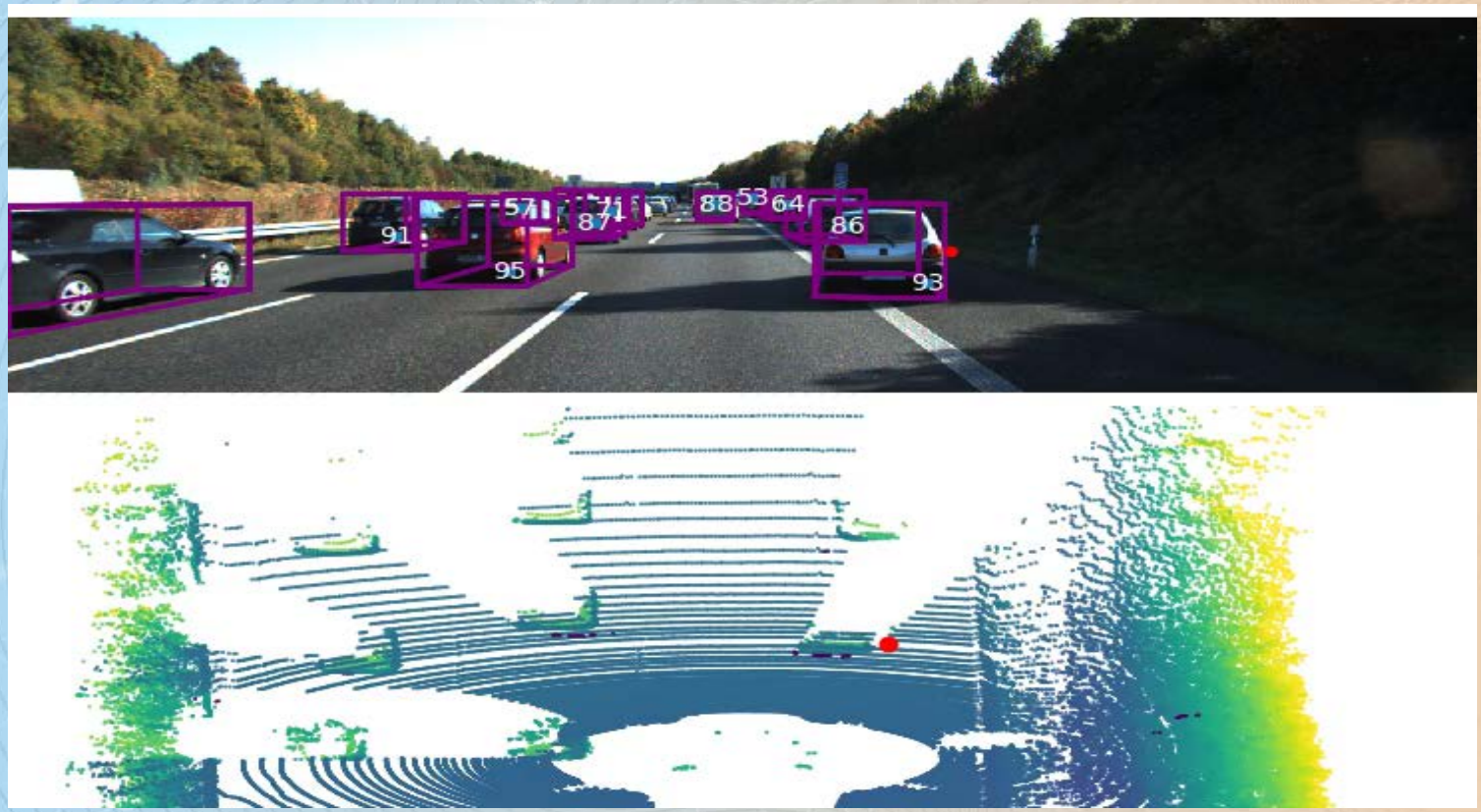
SHORT RANGE RADAR

LONG RANGE RADAR

SURROUND VIEW

3D HIGH – RESOLUTION FLASH LIDAR

Traffic Participant Fusion



Commercial Vehicles

Truck Platooning

Demonstrate automated truck use case

System solution developed together with Knorr-Bremse.

Sensors, CEM, Platoon Management and HMI

Multiple sensors (Lidar, Radar and Cameras)
Holistic HMI for Platooning

V2X communication

V2X solution to allow small inter-truck distances

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CUbE (Continental Urban mobility Experience)

People Mover

- 6 seats / 6 standing places
- Max. 40 km/h speed
- Automated driving level 4 (driverless, no steering wheel & pedals)
- Perception and localization via radar, camera and laser
- Booking via fleet management app
- Camera-based interior monitoring

People and Goods Transportation in Urban Environment

Bee Concept

- Tandem positioned seats for 2 persons
- Rotating and foldable front seat
- Front door entry concept allows wheelchair access
- Max. 60 km/h speed, up to 350 km range
- On-spot front-wheel rotation enables small turning radius
- Exterior HMI for vehicle to pedestrian communication

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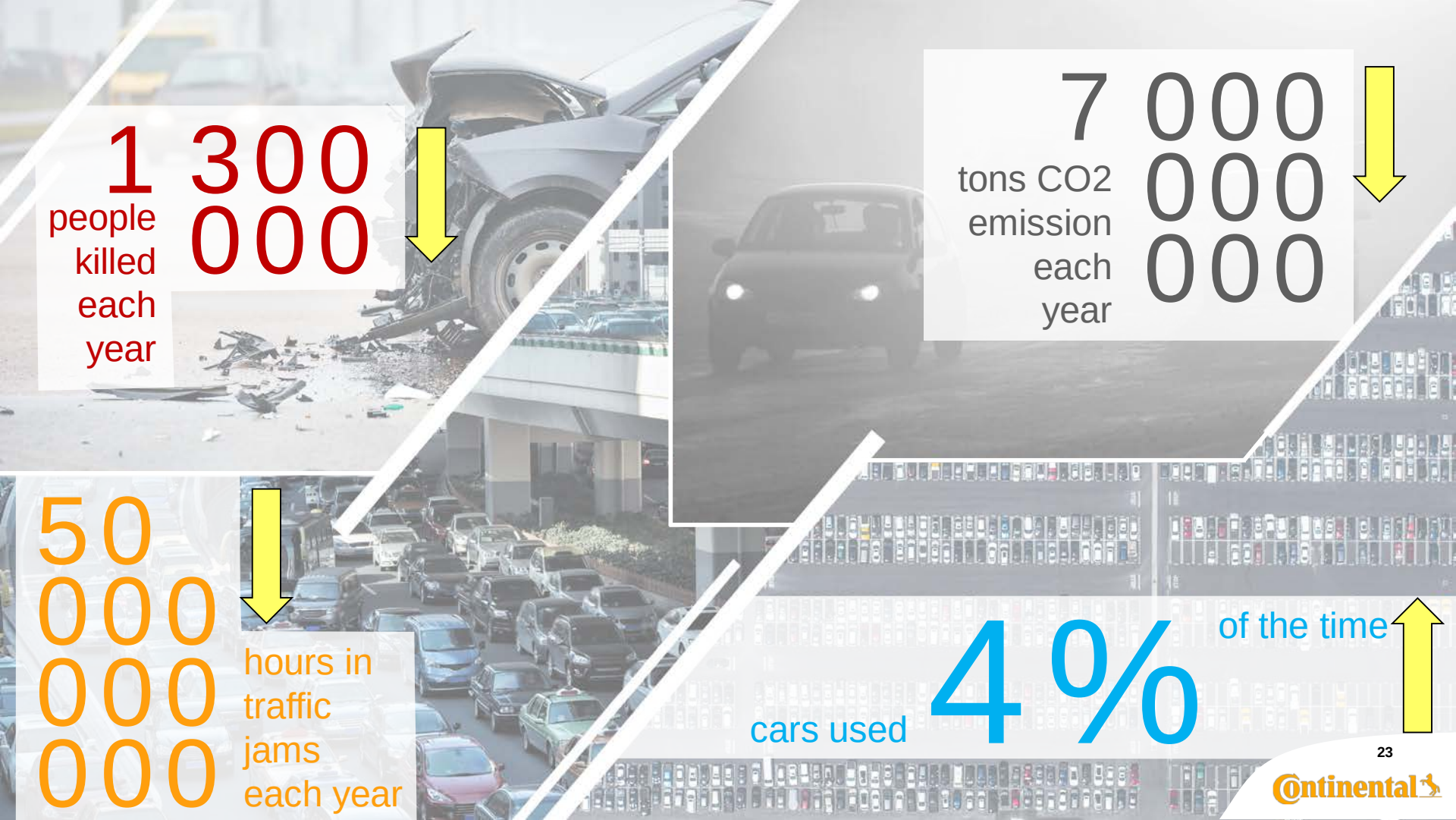

Continental


Monitoring, connectivity and automation
Vehicle sharing and electrification
Vehicle sharing and connected mobility solutions
Shared mobility


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Thank you!