

My Car & me

How Artificial Intelligence
is revolutionizing the way we
interact with our vehicles



Storyline

- 1 Artificial Intelligence: new technological horizons.**
- 2 Your car knows you.**
- 3 Your car perceives you.**
- 4 Your car acts and reacts to your needs and preferences.**
- 5 AI enables the way towards innovative products.**

AI extends our product portfolio and improves our processes

All AI methods contribute to Interior use case



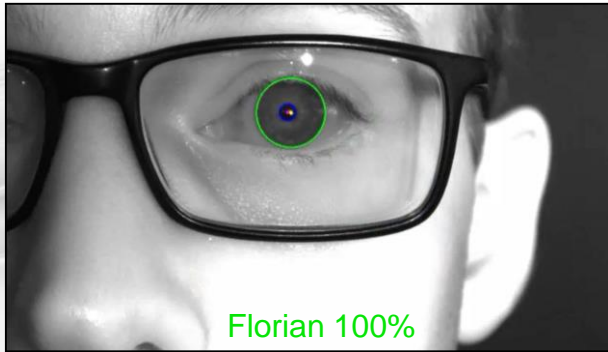
Storyline

- 1 Artificial Intelligence: new technological horizons.
- 2 Your car knows you.
- 3 Your car perceives you.
- 4 Your car acts and reacts to your needs and preferences.
- 5 AI enables the way towards innovative products.

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

Infrared, gamma correction and rescaling

Segmentation

Iris, Pupil, Eyelids detection

Feature Extraction

Iris Info into small Binary Phase Matrix

Matching

Bitwise comparison with stored Matrices

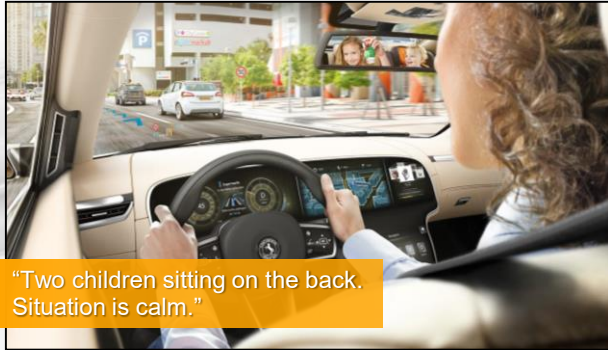
Storyline

- 1 Artificial Intelligence: new technological horizons.
- 2 Your car knows you.
- 3 Your car perceives you.
- 4 Your car acts and reacts to your needs and preferences.
- 5 AI enables the way towards innovative products.

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

Storyline

- 1 Artificial Intelligence: new technological horizons.
- 2 Your car knows you.
- 3 Your car perceives you.
- 4 Your car acts and reacts to your needs and preferences.
- 5 AI enables the way towards innovative products.

Your car acts and reacts to your needs and preferences. (1/2)

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

Digital Companion

How can I help you?

I am interested on how the weather will be in Frankfurt today...

For later today the forecast says scattered clouds at 15°C in Frankfurt am Main.

and in Hannover?

For later today the forecast is broken clouds at 14°C in Hannover.

Type a message...

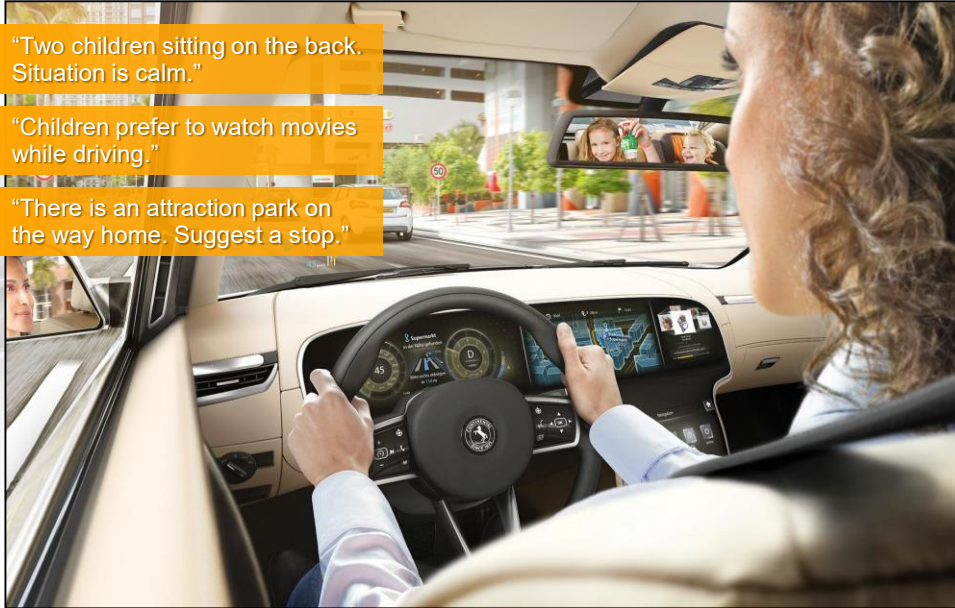
Your car acts and reacts to your needs and preferences. (2/2)

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

"Two children sitting on the back. Situation is calm."

"Children prefer to watch movies while driving."

"There is an attraction park on the way home. Suggest a stop."

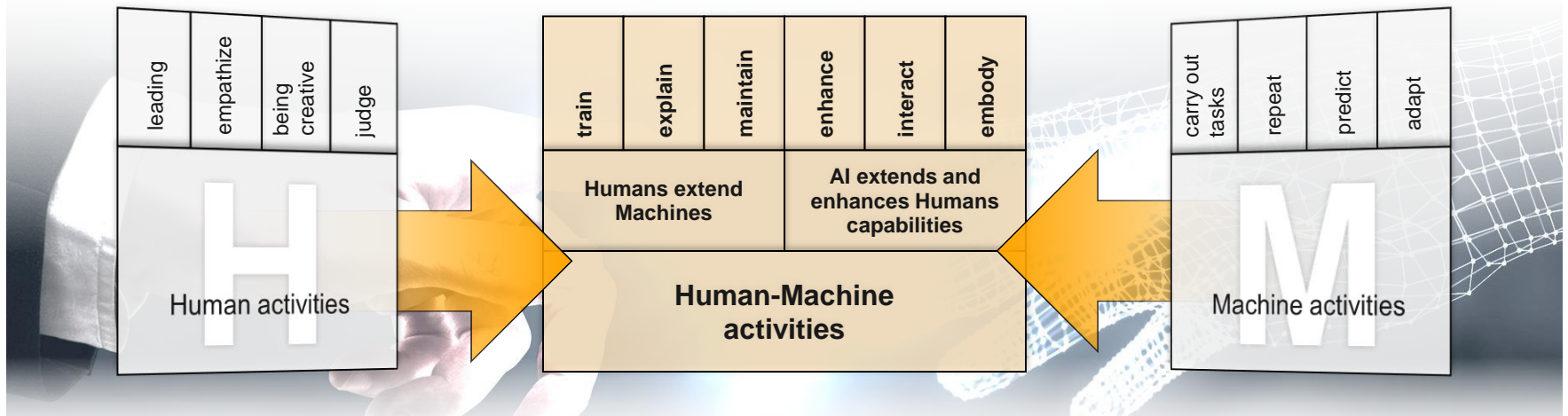


- › Combine user identification with preference learning to adapt and personalize offers while being driven.
- › Learn and associate preferences to user profiles.
- › Ease the human-machine interaction by making offers which match the current driving context.

Storyline

- 1 Artificial Intelligence: new technological horizons.
- 2 Your car knows you.
- 3 Your car perceives you.
- 4 Your car acts and reacts to your needs and preferences.
- 5 AI enables the way towards innovative products.

AI enables the way towards new innovative products via optimization and adaptation of our internal processes.



- › AI algorithms enable to reduce routine daily work via e.g. automatic calibration and parameterization.
- › Our employees have thus more time to dedicate to creative tasks.

See also „Human+Machine, Künstliche Intelligenz und die Zukunft der Arbeit“, P. R. Daugherty, H.J. Wilson.

AI revolutionizes the way in which humans and machines interact and cooperate



<https://waitbutwhy.com/2015/01/artificial-intelligence-revolution-1.html>

Interior Systems & Technology
Artificial Intelligence and Big Data Solutions

Continental Automotive GmbH
VDO-Str. 1, 64832 Babenhausen

Germany