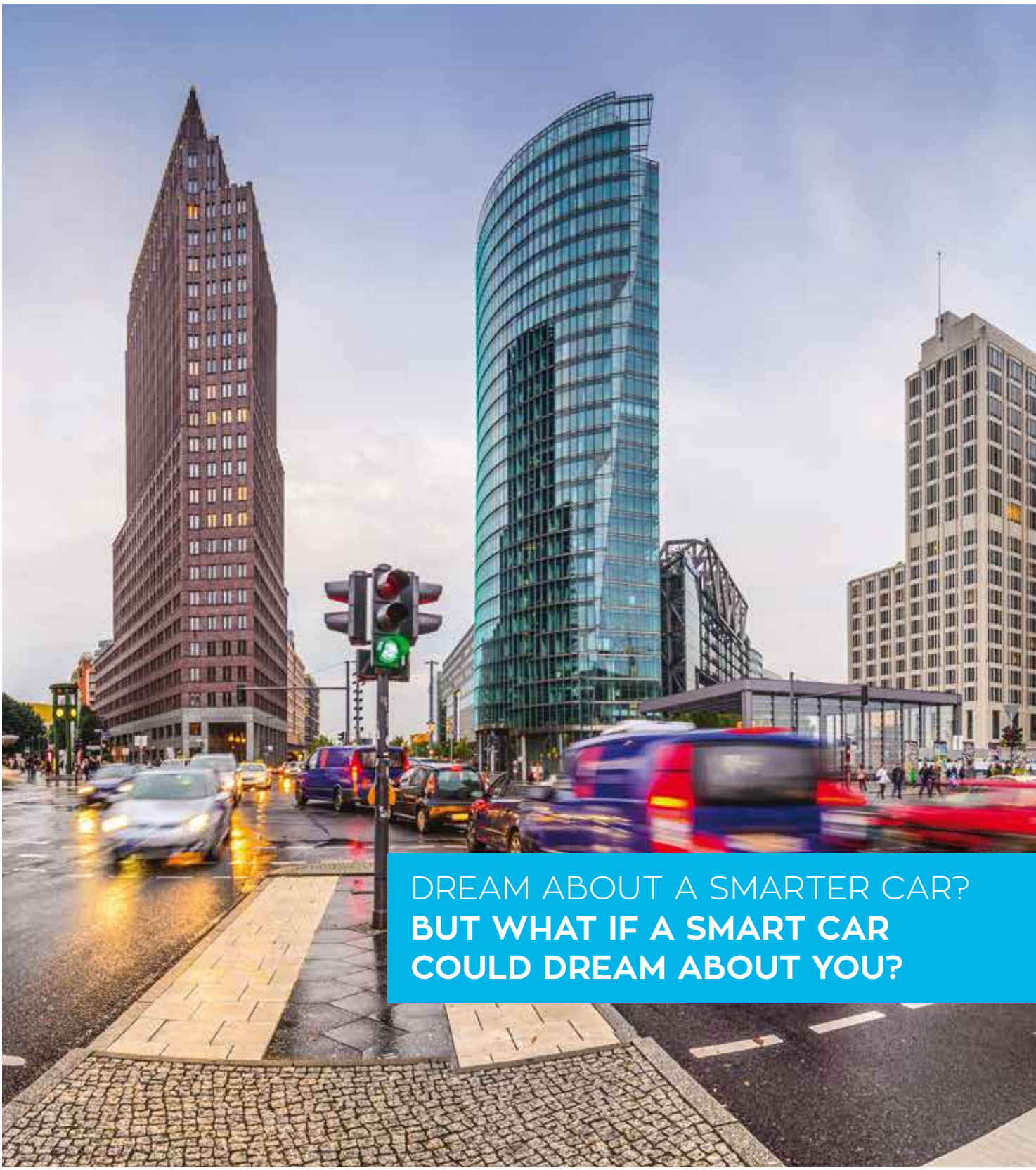
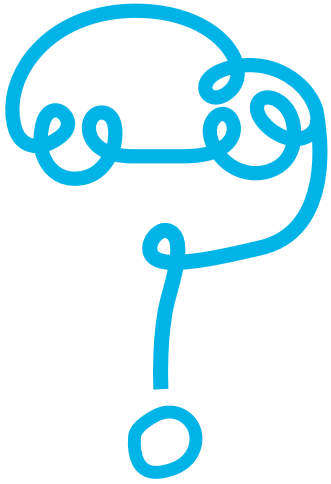
DREAMS4CARS

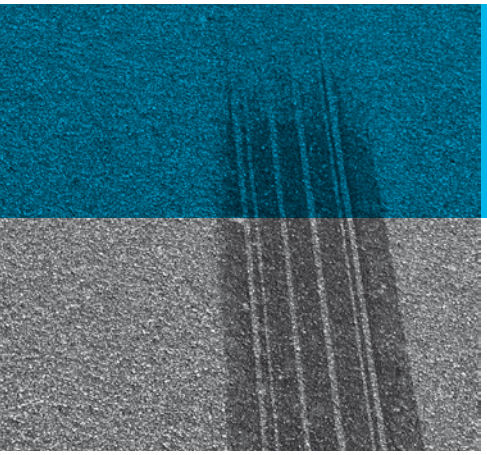


The future of traffic shall be automated, connected and clean. Autonomous driving shall improve safety by significantly reducing accidents, and shall also improve traffic coordination and flow for a more efficient and cleaner transport system. Beyond the societal impacts, autonomous driving is also a major economic factor for Europe.

While human drivers make, on average, one fatal accident every 100 million driven miles, automated vehicles will have to significantly outperform this figure. Automated vehicles should produce optimized behaviors in all the rare nuanced situations that may happen in billions of miles.



Proving the safety of driverless cars is a challenging task, but even more challenging is discovering and optimizing vehicle control for all the situations that may happen in real world driving.

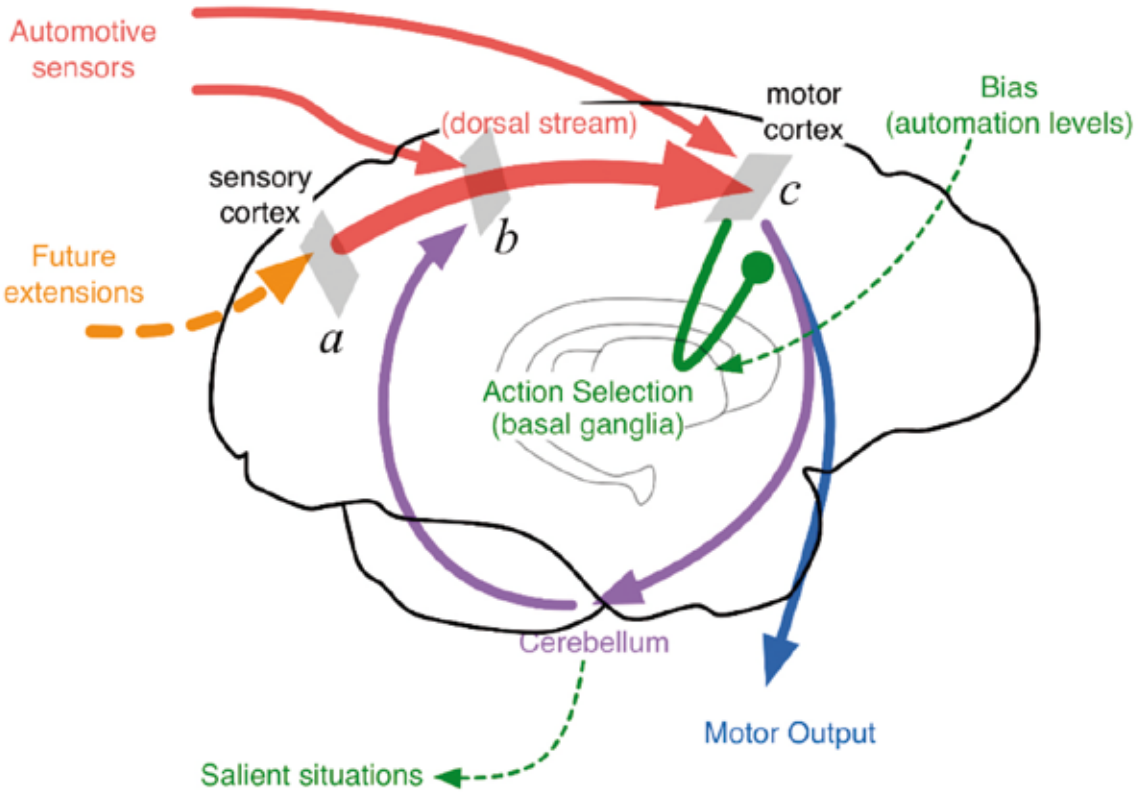


Aim

Dreams4Cars will develop an artificial driving agent with a bio-inspired sensorimotor architecture. Like humans in the wake state, the agent will note novel and salient situations while driving and build these scenarios into its own model of the world. Like humans in the dream state, the agent will then rehearse salient driving scenarios offline, develop imaginary variations of actions, and learn to act in these scenarios in a way that optimizes safety and efficiency.

The dream-like technology developed by Dreams4Cars will be a step change in cognition abilities of agents for automated driving. Dreams4Cars will provide a mechanism to discover critical situations and optimize the vehicle control, contributing to the achievement of the high levels of reliability required for market introduction.

The Agent architecture follows the main loops of the human sensorimotor system. It has a layered control architecture (the dorsal stream) that instantiates affordance from the input of off-the-shelf automotive sensors; the agent has an action selection mechanism enabling adaptive behavior, as well as mechanisms to learn forward models that are used for detecting novelty online, and discovering and optimizing behaviors offline.



DREAMS4CARS

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Partners

The consortium is multidisciplinary with a good balance of the competencies that are needed for the project. Partners complement each other, and together cover the project needs. Each partner brings international level expertise to its assigned tasks.

The partnership comprises seven partners from five countries (Italy, Sweden, United Kingdom and Germany) comprising Four 4 universities, which covers the research and development of the artificial driver.

UNIVERSITY OF TRENTO - Italy

UNITN has expertise in the design of driver assistance systems, developed the co-driver idea for the EU FP7 interactIVe project and is specialized in Optimal Control.

UNIVERSITY OF SKÖVDE

HIS has significant expertise in cognitive robotics, in particular with models and automation.

Middlesex University

MU's background is on Perception-Action (PA) hierarchies, and how these can be produced from first principles.

The University Of Sheffield.

USFD's background is on layered control architecture with action selection in humans and robots, and also on the modelling of forward emulators in the cerebellum.

Deutsches Forschungszentrum für Künstliche Intelligenz GmbH

DFKI plays the key role of linking research to applications. This group will provide the means and infrastructure for the training phase of the artificial driver, providing flexible research grade vehicles and a test site.

CRF CENTRO RICERCHE FIAT

CRF assesses that the simulation technology developed in Dreams4Cars is exploitable and demonstrates with a real vehicle the achievement of TRL 6. CRF also leads the Product Quality Assurance of the artificial driver.

Heich Consult

Consulting - Research - Project Management

HC has a track record in EU-Project management, dissemination and communication and acts as technical- and dissemination manager.

As a true European Project Dreams4Cars is eager to liaise with interested parties from the automotive and robotics community. To get in contact please write an email to info@dreams4cars.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731593.