Dream-like simulation abilities for automated cars: The **Dreams4Cars** project

The **main objective** of Dreams4Cars is to develop a dream-like mechanism in which automated vehicles can produce an emulated world with which they can interact to develop and improve their Perception-Action system.

The trained PA system will then be transferred back to the "live" system, improving sensorimotor control in situations that have been imagined.



Concrete objectives

Implement an artificial driver agent with a Perception-Action (PA) system capable of hosting extendable/reconfigurable behaviours (using a layered control architecture with action selection).
Implement forward emulators producing an emulated world (using combined machine learning

and multi-body system dynamics).

• Implement a technology that discovers and optimises behaviours by means of simulations carried out offline, and which communicates adaptation for online use to all the artificial drivers.

• Demonstrate the effectiveness of this technology by evolving one driving agent with cycles of activity and simulation ('dreams') on research-grade vehicles.

• Port the same agent to a real production vehicle.



Fig 1. Outline of the Dreams4Cars architecture



Fig 2. Neurocognitive inspiration: simulation theories à la Hesslow

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