

Valeo's Smart Cocoon concept is a new user-centric approach, where the car learns from its passengers.



Experts agree that the next evolution of artificial intelligence will be emotional intelligence: machines will become more empathetic and responsive to our emotions so that we can better interact with us. As vehicles become more and more autonomous, "empathic" AI will not only make them safer and more effective, but turn them into personal assistants on the road.

Today's cars have a growing number of sensors and cameras to improve safety and wellbeing in the passenger compartment. But for a human-machine interface to become truly intuitive or empathic, biometric or physiological sensors are not enough. Multiple parameters are necessary for the car to assess passengers' physiological and emotional state—a driver's stress might not be detected by a camera alone, but associated with the detection of heart rate and heat stress, the car can correctly interpret this information.

Valeo have teamed with AI specialists Sensum to explore the impact of this technological evolution on the next generation of vehicles. The new multisensory approach relies on cameras and sensors to cross physiological data with graded emotional characteristics for calculate an emotional comfort index specific to each passenger, then the system adjusts its comfort according to each passenger's calculated mood.

A first concrete application of this field of research is the improvement of safety, thanks to a more precise and faster detection of distraction, drowsiness, fatigue, and suchlike. In the future, the empathic car will become a personalised cocoon for each passenger, based on different stimuli—lighting, thermal comfort, acoustics, perfumes—to create a unique multisensory experience for each trip. As machines replace the human interface, they must be able to better understand our emotions. Experiments like these by Valeo and Sensum are predicated on the

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forecast that the pleasure of mobility will be less a question of driving performance than a matter of personalisation of the passenger experience.