

RESEARCH THEME

XLI Cycle – a.y. 2025/2026

Title of the doctoral research Naturalness of autonomous vehicles: measuring the naturalness of interaction between driver and car

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Abstract The rise of automation is proceeding rapidly and the autonomous vehicle, which constitutes a form of artificial life, will soon be a reality on the streets. The research will address a fundamental issue which must be addressed if the new autonomous vehicles are to be accepted and appreciated by the general public. Autonomous vehicles represent a unique challenge for designers due to their lack of historical precedence, making them unfamiliar to most people. While familiarity and simplicity are widely recognized as essential elements for successful design in products, systems, and services, the same cannot be said for the autonomous vehicles. Consequently, determining which characteristics and behaviours of autonomous vehicles might be perceived as "natural" by the general public is currently a design challenge. This research aims to explore the physical, psychological, and sociological aspects of "naturalness." Building upon previous studies conducted on conventional automobiles, this new research will explore how the interactions with autonomous vehicles, which possess more human-like anthropomorphic qualities, will differ. The research will specifically probe mental constructs such as intuitiveness, meaningfulness, naturalness, trust, control, free will and ethics to analyse existing driver stereotypes about the non-verbal and verbal channels of communication in current automobiles and in the new autonomous vehicles. The research will deliver criteria for evaluating whether an interaction with an autonomous vehicle can be considered "natural or not" and will define design guidelines for introducing the criteria into the automotive design process.

Keywords Naturalness, semiotic communication, human centred design