

NEURAL CORRELATES OF HUMAN-MACHINE TRUST IN AUTONOMOUS VEHICLES CONTEXT

ANASTASIOS BEZERIANOS¹ AND ANDREI DRAGOMIR²

¹ *Information Technologies Institute, Centre for Research and Technology
Hellas (CERTH), Thessaloniki, Greece*
anastasios.bezerianos@gmail.com • <https://thalis.math.upatras.gr/bountis>

² *The N.1 Institute for Health
National University of Singapore, Singapore*
anastasios.bezerianos@gmail.com • <https://neuroeng.org/cognitive-engineering>

Human-machine trust has largely been monitored subjectively, based on self-reported measures, with studies attempting only recently to seek objective measures for trust by surpassing difficulties in capturing the complex aspects of this multifaceted cognitive state. Nevertheless, recent progress in neurophysiological sensors development, as well as neuroimaging technology and cognitive neuroscience have brought the perspective for objective trust monitoring to reality. A particular area of application in which research on objective trust measurement has been thriving is that of intelligent vehicles and, particularly, the interaction between human drivers and autonomous vehicles. In this presentation we outline several aspects for understanding the cognitive, affective and behavioural components of driver trust, and identifying neural correlates of human-autonomous vehicle trust using behavioural, physiological and brain-based measurements. Future directions for improving trust monitoring towards practical implementation are also discussed.

References

- [1] M. Seet, A. Dragomir, J. Harvy, N. Thakor, and A. Bezerianos, “Objective assessment of trait attentional control predicts driver response to emergency failures of vehicular automation”, *Accident Analysis and Prevention*, 2022.
- [2] M. Seet, J. Harvy, R. Bose, A. Dragomir, A. Bezerianos, and N. Thakor, “Differential impact of autonomous vehicle malfunctions on human trust”, *IEEE Transactions on Intelligent Transportation Systems*, 2020.
- [3] H. Abbas, “Social Integration of Artificial Intelligence: Functions, Automation Allocation Logic and Human-Autonomy Trust”, *Cognitive Computation*, 2019.
- [4] K. Akash, W.-L. Hu, N. Jain, and T. Reid, “A classification model for sensing human trust in machines using eeg and gsr”, *ACM Transactions on Interactive Intelligent Systems (TiiS)*, 2018.