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Modifying appearance to increase trust during human-computer interaction using a real-time brain-computer interface

Abstract

The noticeable progress in the field of artificial intelligence, present in many aspects of our lives, raises a natural question: how to establish relationships with machines characterized by mutual trust? The article introduces the idea of a brain-computer interface (BCI) that analyzes the user's brain signals in real time and uses them to change the appearance and reactions of a virtual partner. The ambition of this approach is to create a mechanism for social interaction—a situation in which the system not only responds to a person's emotional state, but actively builds a bond with them based on empathy and emotional harmony. The article is part of the current discussion on trust in human-AI relationships, drawing attention to the weaknesses of existing solutions, which are often based on observable reactions, ignoring the sphere of subconscious neurophysiological responses. The proposed model integrates EEG analysis with comprehensive emotion assessment and generative image change. The article describes its structure, possible applications, as well as technical and ethical issues related to the use of brain data.

The presented concept sets a new path for the development of interactive systems, in which the exchange of information between humans and artificial intelligence ceases to be one-sided and takes on the characteristics of mutual understanding. The combination of neuroadaptation and visual expression may become the basis for more empathetic, transparent, and socially responsible technologies of the future.