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Peer Review

Review of: "Differentiating Conscious Human Entities From Autonomous AI Agents: A Heart Rate Variability (HRV) Framework for Human Authentication in the Emerging AI Economy"

Yulin Teng[1]

1. Electric Power Research Institute, Palo Alto, United States

This paper proposes an HRV-based framework for differentiating live human participants from autonomous AI agents in AI-augmented work environments. The central idea is to use contactless HRV sensing via mmWave radio as a physiological anchor for continuous human presence verification. I have the following concerns:

1、The authors should provide a clearer decision pipeline, including features, thresholds, confidence score computation, and how absence/presence over time is aggregated.

2、HRV can support live human presence verification, but it does not by itself prove that the human produced the work. The authors should narrow some claims from “human authorship verification” to “human presence verification” unless additional engagement or output-analysis evidence is incorporated.

3、The discussion of replay, synthetic injection, mannequins, relay attacks, and challenge-response mechanisms is useful, but the risk levels in Table 2 are not quantitatively supported.

4、The paper discusses HRV-based identity binding, but HRV varies with stress, fatigue, medication, illness, and circadian rhythm. The authors should clarify whether HRV is intended mainly for liveness/presence verification or for stable user identity authentication.

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Declarations

Potential competing interests: No potential competing interests to declare.