RESEARCH TOPIC PRIME8
Adaptive Cognitive Enhancement Framework: Personalized Mental Support through Multimodal Data Analytics

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Abstract
Lifestyle and physiological factors significantly impact mental health and cognitive performance. This research uses multimodal data (e.g., physiological signals, behavioral patterns, psychometric assessments, and clinical data) to create personalized systems for enhancing mental well-being and cognitive performance.

Machine learning-driven tools can provide interventions based on user data, applicable in various contexts, such as adaptive e-learning for students and solutions for supporting mental health and cognitive performance in daily life, the workplace, and clinical settings. By integrating emotional data (e.g., mood, stress levels) and neurophysiological measures (e.g., heart rate variability, EEG, GSR), these systems can optimize cognitive function, supporting individuals in managing their mental health and boost overall performance. In this context, collecting data in clinical and hospital settings enables a more precise understanding of the factors affecting mental health.

Main technical approaches
-Data Collection and Sensor Integration: Use of wearable devices to collect physiological data (e.g., heart rate, EEG).

-Machine Learning and Data Preprocessing: Skills in machine learning, deep learning, and feature extraction.

-Personalized Feedback Development: Use of reinforcement learning techniques.

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