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Developing a Mentoring System Based on Behavior Logging and Personalized Cognitive Modeling

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Abstract

This research introduces an intelligent mentoring system that utilizes behavioral logs and cognitive modeling to provide personalized learning interventions. The system analyzes semantic patterns during web browsing to estimate cognitive parameters and predict task completion times. By employing CLIP, the system evaluates semantic alignment between learning objectives and accessed resources. Our experimental study with eight postgraduate students serves as a starting point for ACT-R cognitive parameter estimation. The system tracks both content relevance and user interest as internal human dynamics to maintain engagement with study materials. By integrating ACT-R architecture to estimate working memory capacity, attention span, and anxiety levels, the system maps these parameters to observed browsing behaviors. This dual-stage approach enables real-time cognitive estimation and personalized schedule generation, establishing a foundation for adaptive learning technologies that provide tailored interventions based on semantic dynamics analysis and cognitive parameter estimation.