

## ABSTRACT

The Forgotten Knowledge Tracker is an intelligent system designed to address the problem of knowledge decay by automatically monitoring learning activities and optimizing review schedules through artificial intelligence and cognitive science principles. The system functions as an automated learning assistant that observes user behavior across multiple modalities, including screen content, audio environment, visual attention, and interaction patterns. These input streams are processed through machine learning models and natural language processing pipelines to identify when a user is engaged in active study and to extract meaningful concepts from the material being learned. Using these extracted concepts, the system constructs a dynamic knowledge graph that semantically represents the user's personal learning network. Each node in this graph is assigned a memory score derived from the Ebbinghaus forgetting curve and adjusted using multi-modal attention factors to model cognitive retention in real time. By continuously updating this graph, the system predicts when specific topics are likely to be forgotten and schedules optimal review times through spaced repetition algorithms. All data is stored locally in a secure SQLite database and visualized through an interactive dashboard that displays knowledge graphs, memory health, attention analytics, and study trends. The overall objective of this work is to transform passive computer usage into an active cognitive tracking process, providing a transparent and efficient mechanism to preserve long-term knowledge. Through the integration of artificial intelligence, cognitive modeling, and behavioral analytics, the Forgotten Knowledge Tracker offers a scientific and automated approach to human memory management, ensuring that learned information remains accessible and effectively reinforced over time

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