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Authors

Kodikara, Nilupul Heshan Randika

Unito, Sorita

Gunasekara, Nethmee Rasanga

et al.

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Sensemaking Dynamics in Information-Rich Environments - A Semantic Trajectory Approach

Nilupul Heshan Randika Kodikara¹, Sorita Umito¹, Joy Karmoker¹, Nethmee Rasanga Gunasekara¹, and Junya Morita¹

¹Shizuoka University, Hamamatsu, Shizuoka, Japan

Abstract

How do people construct coherent understanding while navigating information-rich digital environments? We address this question by modeling sensemaking as a trajectory through semantic space, representing web navigation not as discrete page visits but as a continuous path through meaning. By analyzing the semantic content of web pages accessed during research tasks, we demonstrate that users' navigation patterns reveal two distinct forces: alignment toward task-relevant information and coherence with recently explored content. Statistical analysis showed that goal-directed alignment dominates information consumption, while motivational interest has a negligible influence. This dissociation provides evidence that sensemaking operates as a distinct cognitive process, independent of intrinsic motivation. Temporal patterns in browsing behavior, including how users maintain semantic coherence, drift from their goals, and accumulate meaning over time, reveal the hidden cognitive dynamics underlying knowledge construction. Our framework establishes semantic trajectories as a measurable phenomenon, bridging information foraging theory with modern computational models of meaning. This work reveals that the path users trace through information spaces reflects fundamental cognitive processes of interpretation and integration, offering new methods for studying how understanding emerges from interaction with complex digital environments.