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Grounding User Models in Think-Aloud Protocols

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Abstract

Modeling the cognitive processes underlying everyday computer use is both a longstanding goal of cognitive science and a prerequisite for systems that genuinely understand their users. Recent work on general user models pursues this goal by inferring user states from behavioral observations such as screenshots and action logs. Behavior alone, however, underdetermines the algorithmic-level processes (Marr, 1982) that generate it: distinct reasoning trajectories routinely yield identical actions, leaving inferred user states confounded with the inductive biases of the inferring model.

We argue that the think-aloud method (Newell & Simon, 1972; Ericsson & Simon, 1993) offers process-level evidence that behavioral traces cannot, and that recent advances in automated transcription and LLM-based coding make it feasible at ecological scale. Reframing user modeling as the recovery of structured reasoning traces, rather than the prediction of behavior, positions cognitive science to contribute foundational representations to a problem currently dominated by behavioral proxies.