UC Merced

Proceedings of the Annual Meeting of the Cognitive Science Society

Title

Gradations in task engagement emerge from metacognitive priority control

Permalink

https://escholarship.org/uc/item/8kv185r8

Journal

Proceedings of the Annual Meeting of the Cognitive Science Society, 41(0)

Authors

Mussack, Dominic

Schrater, Paul

Publication Date

2019

Peer reviewed

Gradations in task engagement emerge from metacognitive priority control

Dominic Mussack
University of Luxembourg, Belval, Luxembourg

Paul Schrater
University of Minnesota, Twin Cities, Minneapolis, Minnesota, United States

Abstract

Engagement is a critical motivational factor that has broad effects on learning, productivity, performance, and even satisfaction and happiness. However, it can also be impacted by a myriad of factors which have made it difficult to model and design interventions. Here we address this problem by developing an integrated metacognitive framework for understanding task engagement. We treat engagement as resulting from a unified metacognitive decision process where the gradient of engagement results from a common priority calculation. Priority signals are computed relative to a set of available tasks and updated across time and environmental changes. We propose a metacognitive controller makes decisions about both task switching (when to quit, next task) and cognitive resourcing (working memory, attention, etc) using the graded priority signals. By simultaneously choosing the task and allocating resources using the same graded signals, we capture the complex dependencies of engagement with task errors, performance, and time allocation.