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Optimized behavior in a robot model of sequential action

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Abstract

People learn and use complex sequential actions on a daily basis, despite living in a high-dimensional environment and body. Sequential action learning is sometimes studied in cognitive psychology using button-pressing tasks such as Nissen and Bullemers (1987) serial respone time (SRT) task. However, the SRT task only measures the speed of button presses, neglecting the richand difficult to controltrajectory of the arm, which can show predictive movements and other contextual effects. In this study, we evolve neural networks to carry out a mouse-based SRT task under conditions of differing prediction uncertainty. We replicate behaviors found in a recent human experiment, and explore ramifications for human sequence learning.