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Dynamics of Bayesian non-Gaussian sensorimotor learning with multiple time scales[1] BAOHUA ZHOU, DAVID HOFMANN, SAMUEL SOBER, ILYA NEMENMAN, Emory University — Various theoretical and experimental studies have suggested that sensorimotor learning in animals happens on multiple time scales. In such models, animals can respond to perturbations quickly but keep memories for a long period of time. However, those previous models only focus on average learning behaviors. Here, we propose a model with multiple time scales that deals with the dynamics of whole behavior distributions. The model includes multiple memories, each with a non-Gaussian distribution and its own associated time scale. The memories are combined to generate a distribution of the desired motor command. Our model explains simultaneously the dynamics of distributions of the songbird vocal behaviors in various experiments, including adaptations after step changes or ramps in the error signals and dynamics of forgetting during the washout period, where an immediate sharp approach to the baseline is followed by a prolonged decay.

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