

A Model for Sequential Processing and Sequence Learning

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Presentation Abstract Summary We set out to model how the human brain perceives and learns nested sequential structures. Both neural phenomena (functional and dynamical timescales in the neocortex) as well as behavioral phenomena (the learning of sequences embedded within sequences) indicate the presence of a hierarchical system for temporal perception and learning. We modeled these phenomena using HTRACX, a model composed of stacked auto-encoders, with local memory and inter-layer communication modulated by surprise. Using HTRACX we reproduce (i) features of functional and dynamical hierarchy in neocortical population dynamics and (ii) learning of embedded chunks observed in human behavior.

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