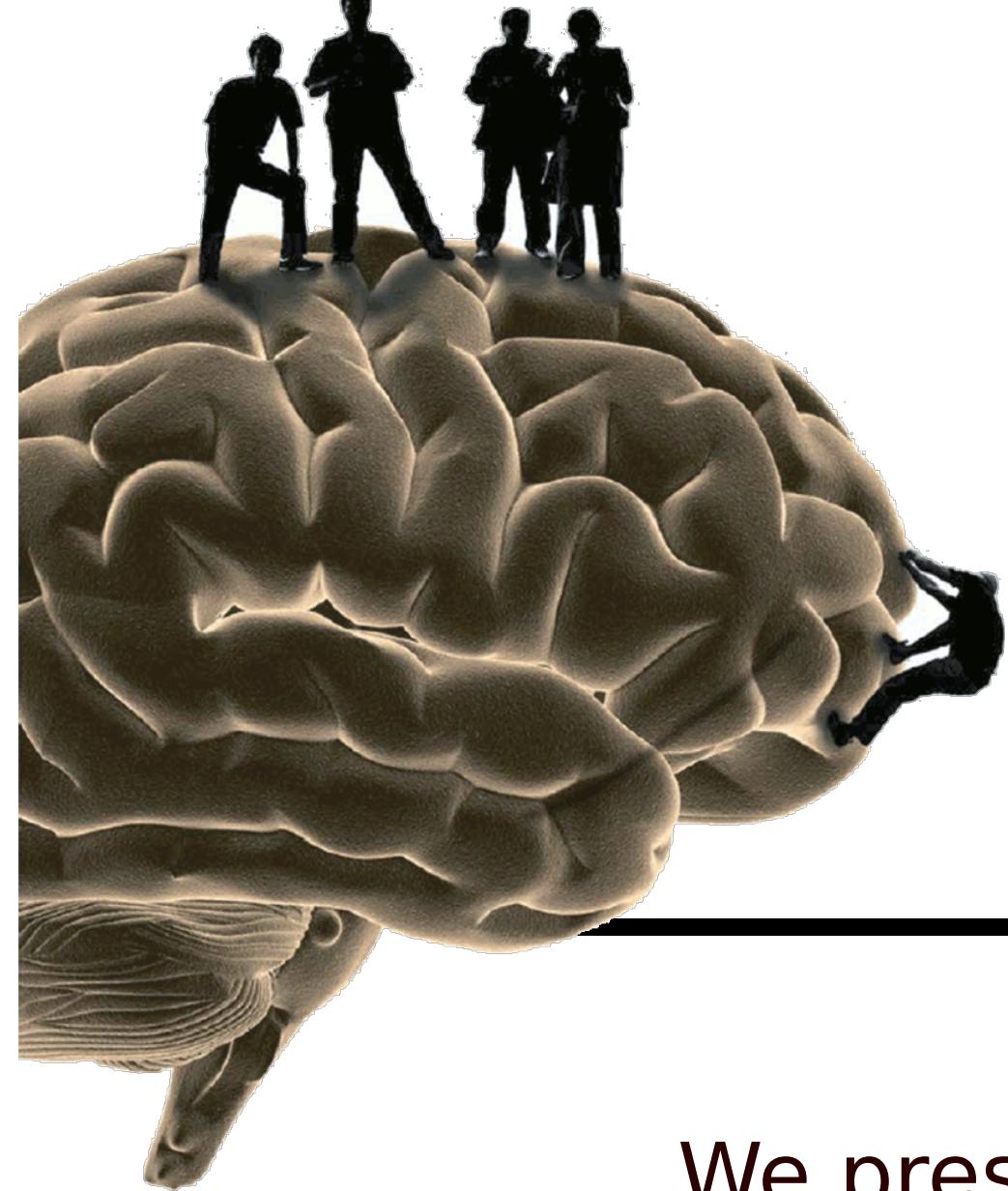


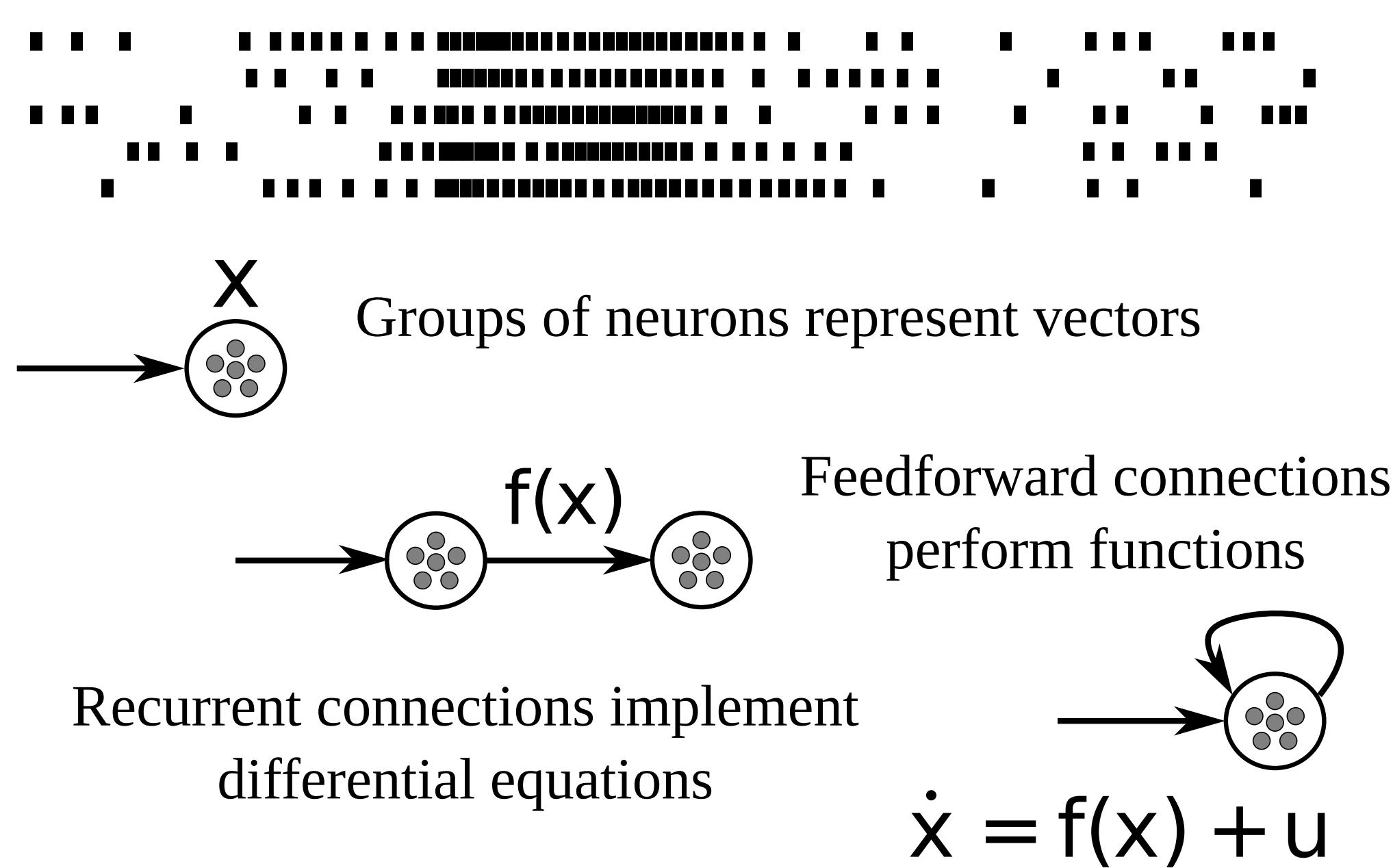
Trajectory generation using a spiking neuron implementation of dynamic movement primitives

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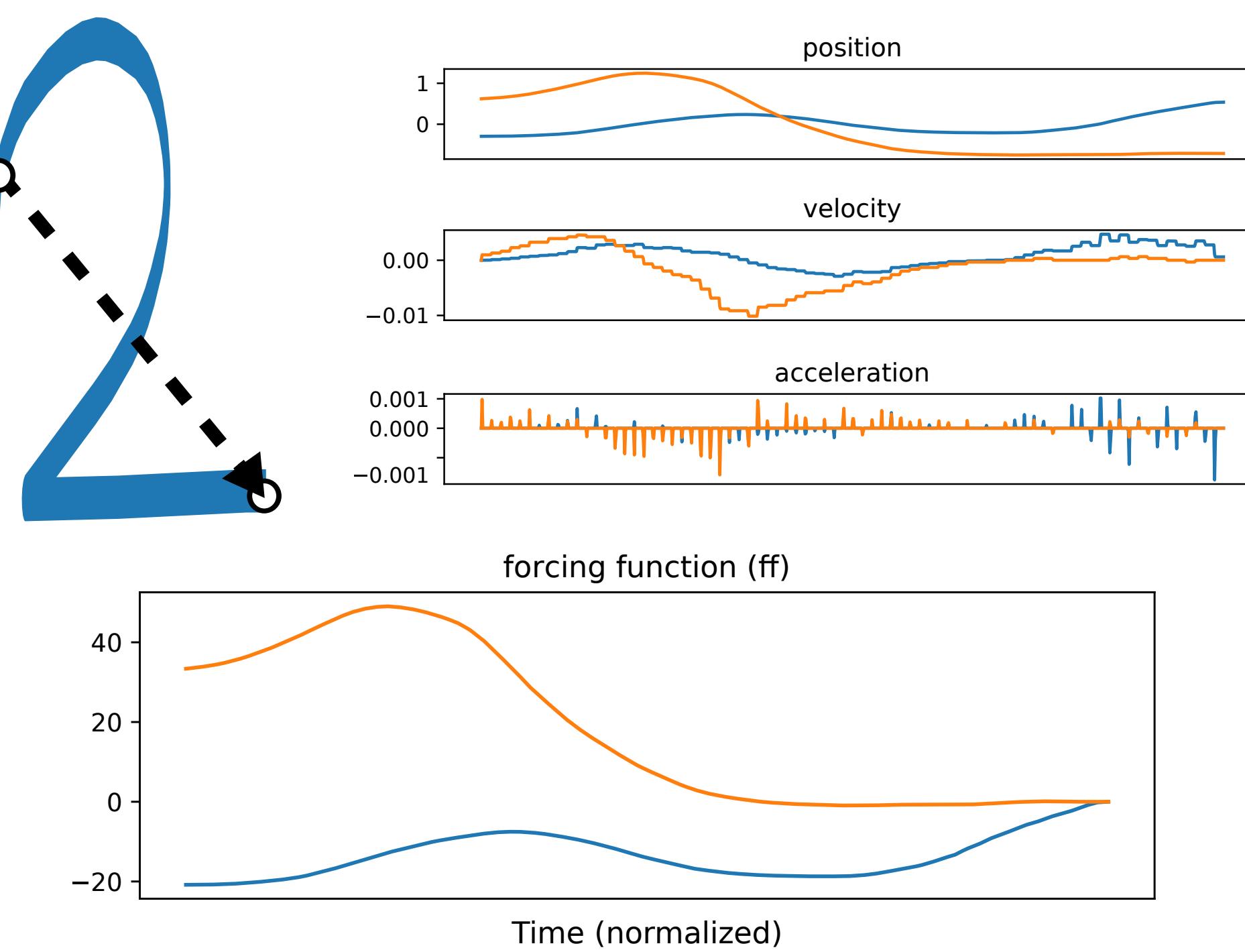


We present a trajectory generating circuit using efficient function representation coding in a spiking neural network that can generate multiple complex trajectories dynamically from a single network. Integrating multiple trajectories within a single network allows us to explore the transitions between movements. We suggest that this kind of network is a possible mechanism for efficiently storing a wide array of movement features in the cortex, and compare our results to experimental data.

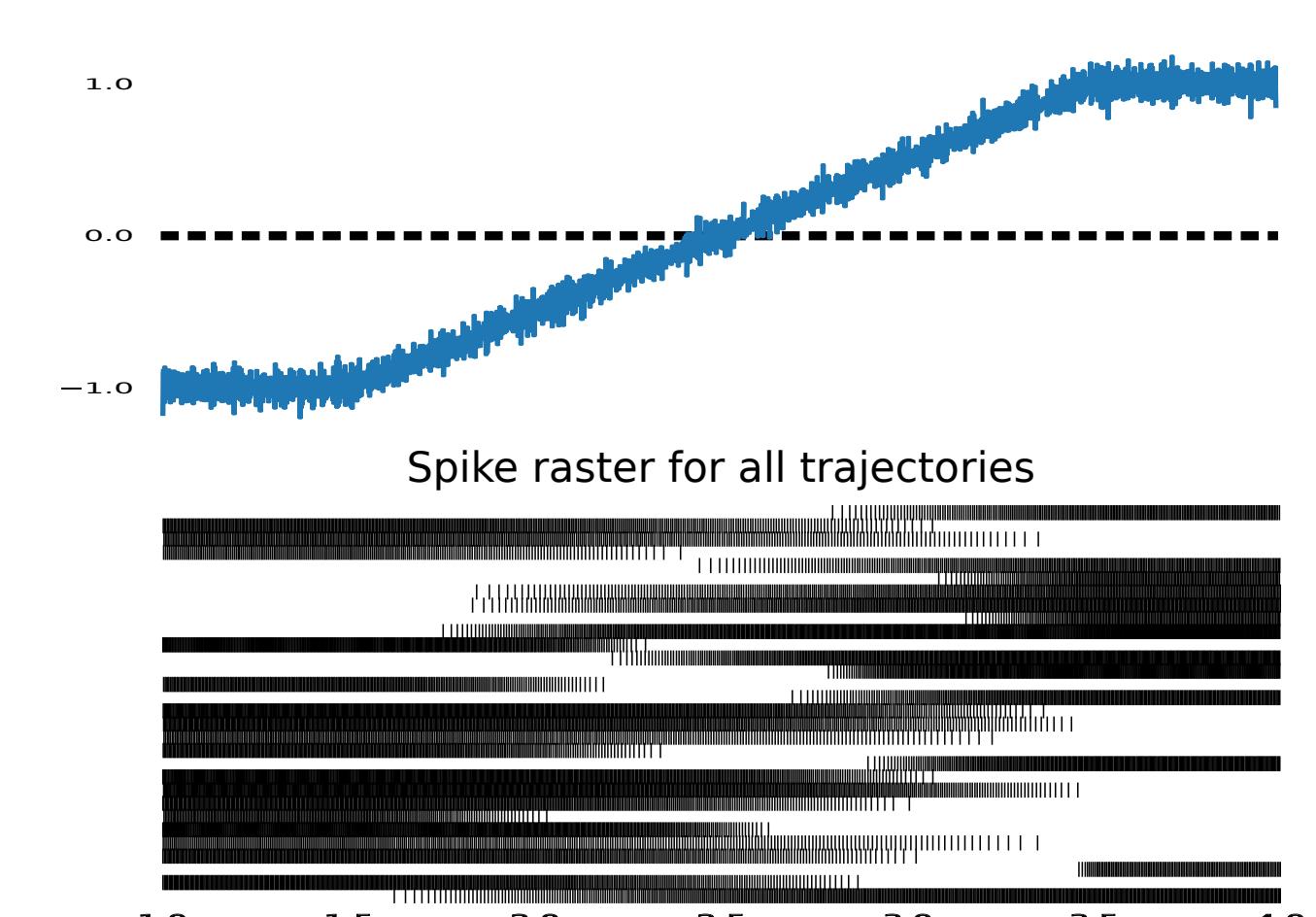
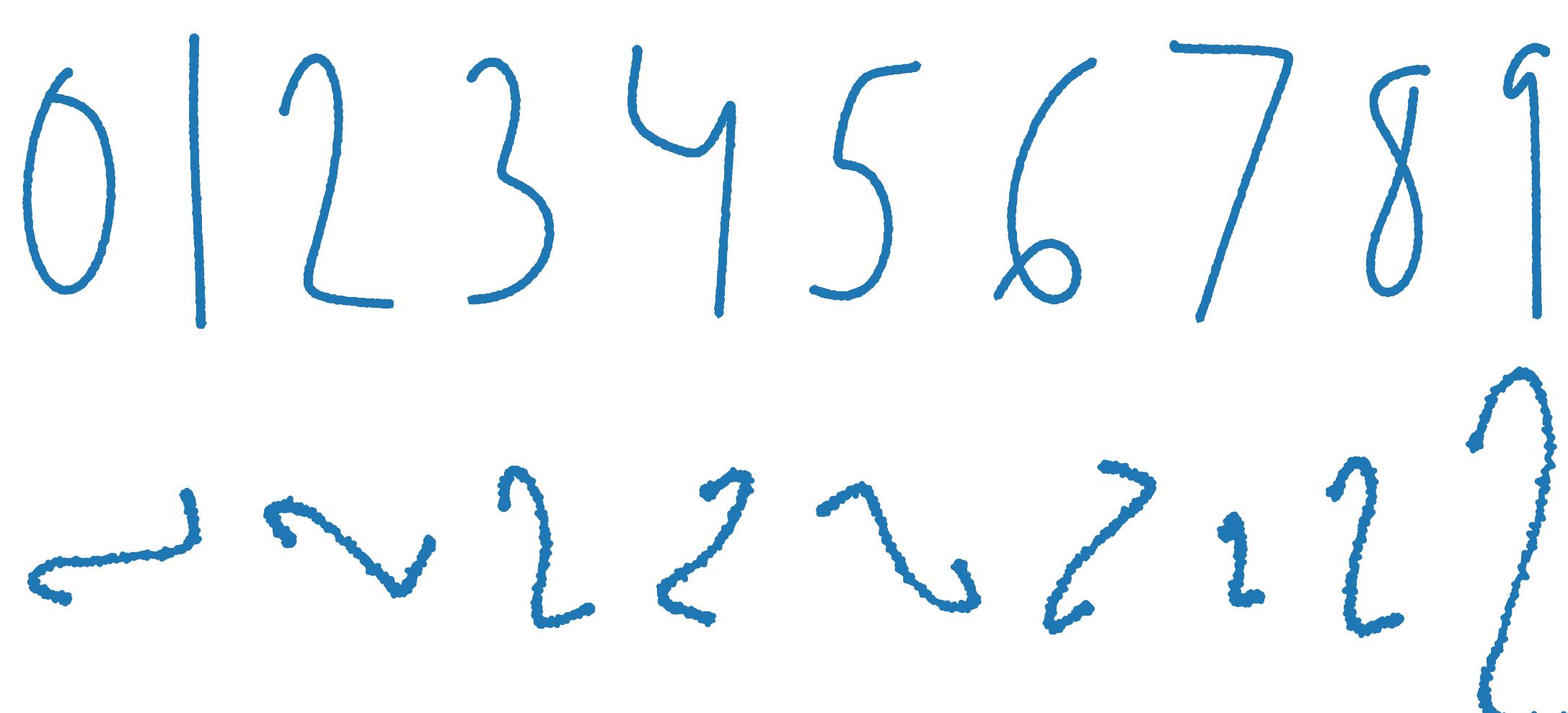
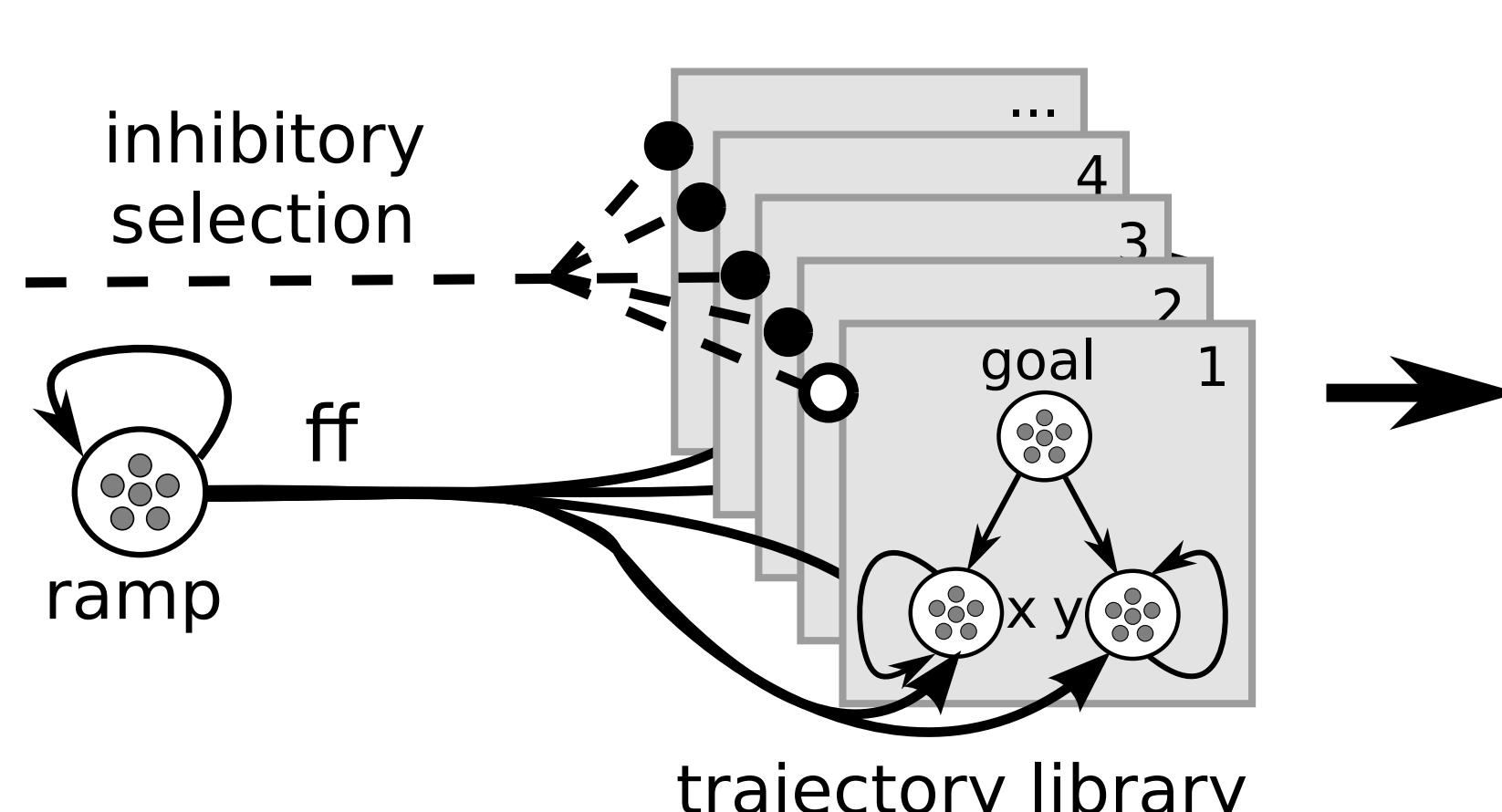
The Neural Engineering Framework (NEF)



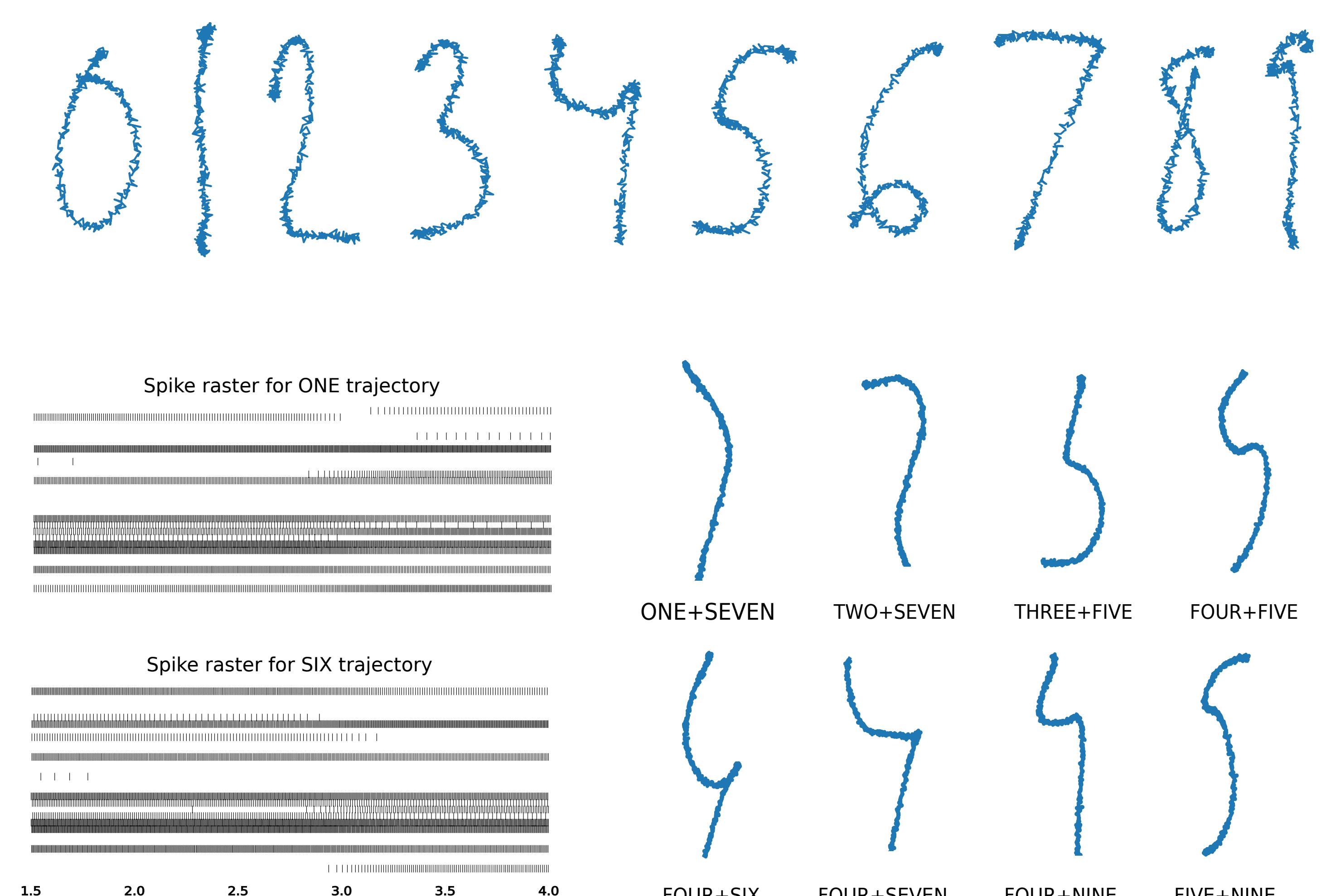
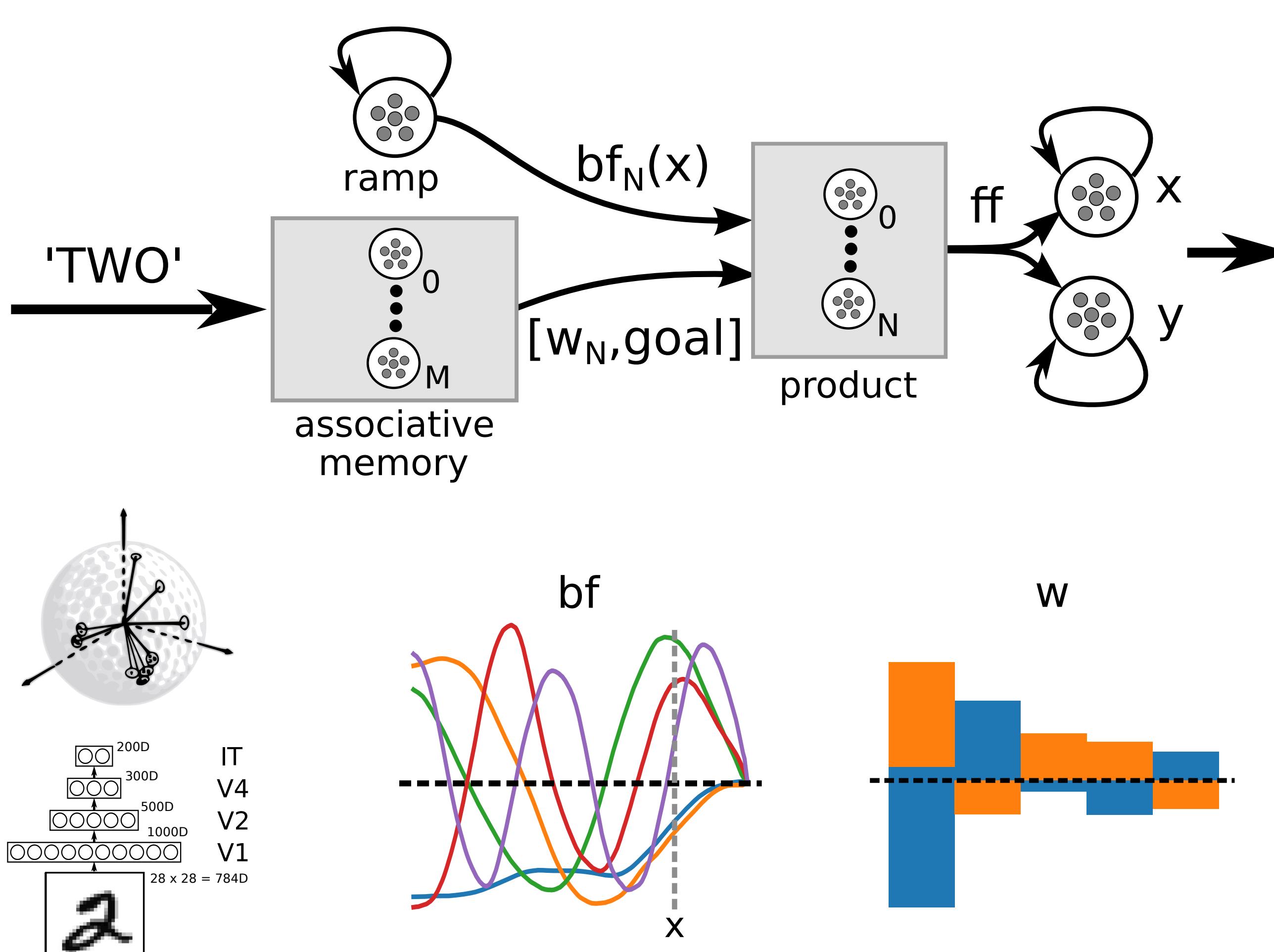
Dynamic Movement Primitives (DMPs)



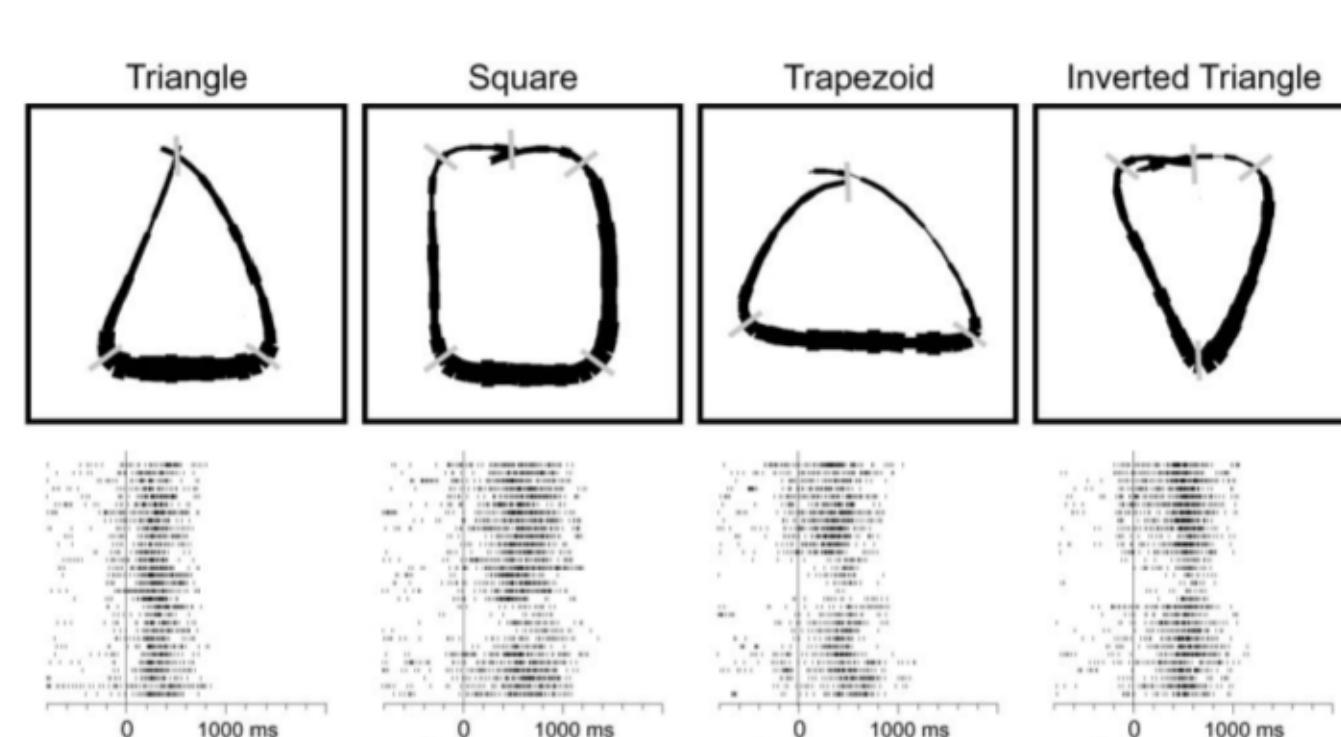
— Neural DMPs (NDMPs) —



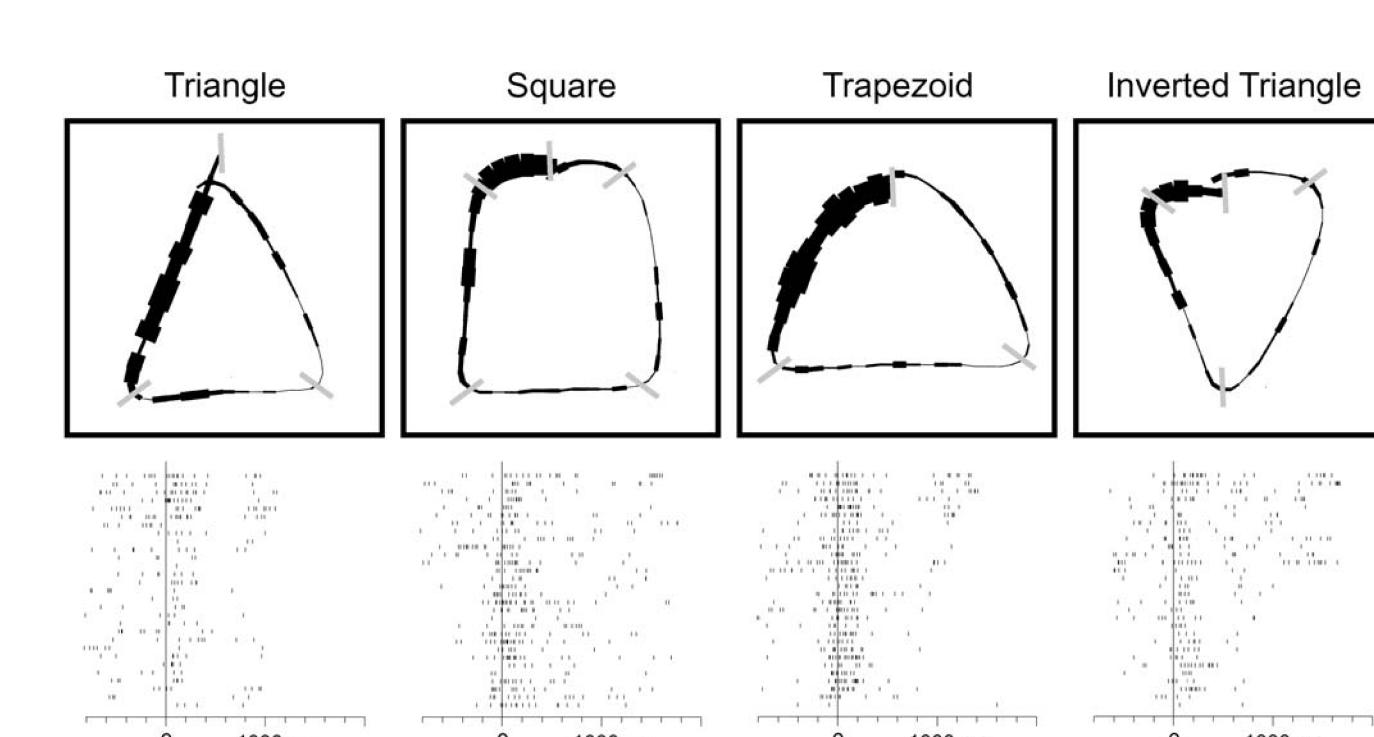
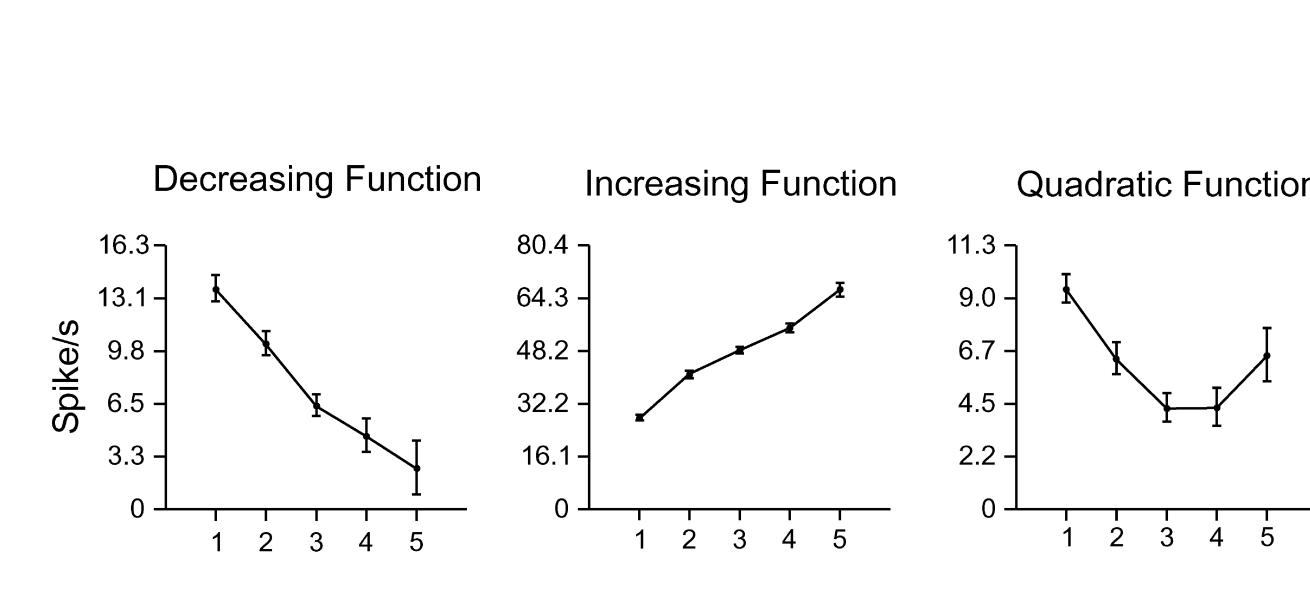
— NDMPs in function space —



— Related experimental data —



The activity of a single prefrontal neuron during copy performance. Neural activity increased markedly at specific points in the copy trajectory of each shape. (Averbeck et al, 2003)



The activity of a prefrontal neuron that increased during the drawing of the first segment of all shapes. Conventions as in Fig. 6. (Averbeck et al, 2003)