



Schematic of research agenda

Synthetic stimuli with precisely controlled structural correlations will be the inputs to a recurrent neural network.

- 1) Responses to temporal correlations in the stimulus will be used to extract predictive information.
- 2) Correlated stimulus features that redistribute ongoing activity to evoke the biggest responses will be determined using mean-field theory and numerical simulations of the phase transition between background- and stimulus-driven activity.
- 3) Natural distortions will be modeled by changing the connectivity and the high-order correlations in the stimulus.
- 4) My theoretical results and predictions about neural representation of structured multi-sensory objects will be validated using neural population data from electrophysiology and imaging experiments.