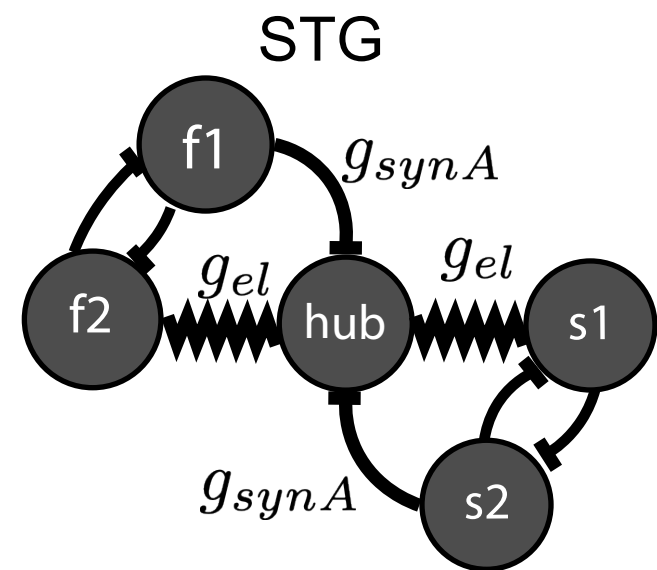
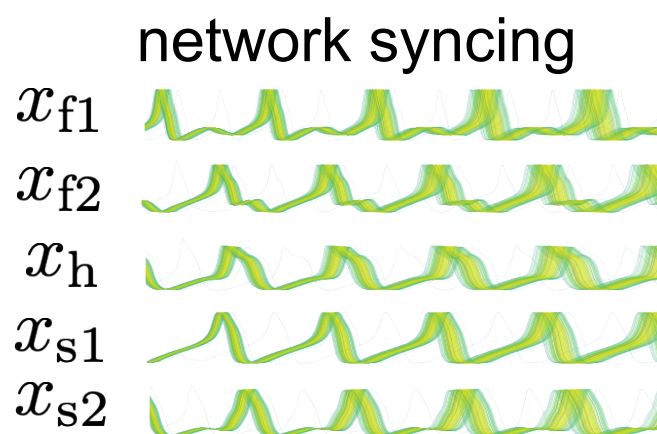
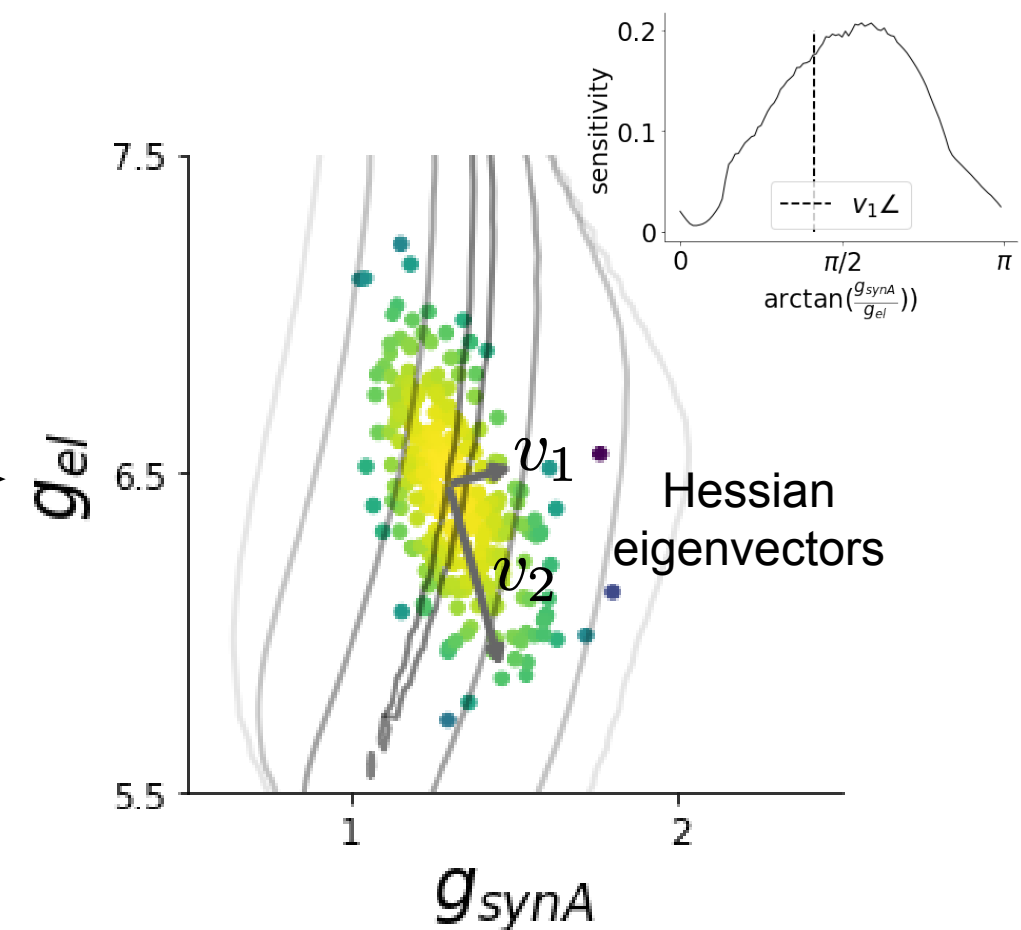


A

biological  
modelemergent  
propertyEmergent property  
inference (EPI)

B



C

Emergent property inference (EPI)  
training objective

$$q_{\theta}^* = \arg \max_{q_{\theta} \in Q} H(q_{\theta})$$

s.t.  $\underbrace{E_{z \sim q_{\theta}}}_{\text{model parameter samples}} \left[ \underbrace{E_{x \sim p(x|z)}_{\text{model simulations}} \left[ \underbrace{T(x)}_{\text{emergent property statistics}} \right] \right] = \underbrace{\mu}_{\text{emergent property constraints}}$

D

Deep probability distribution

