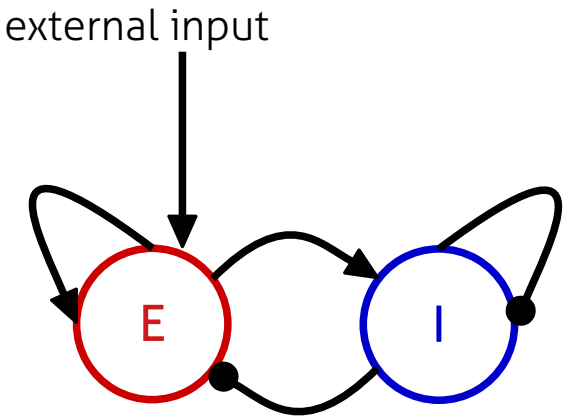
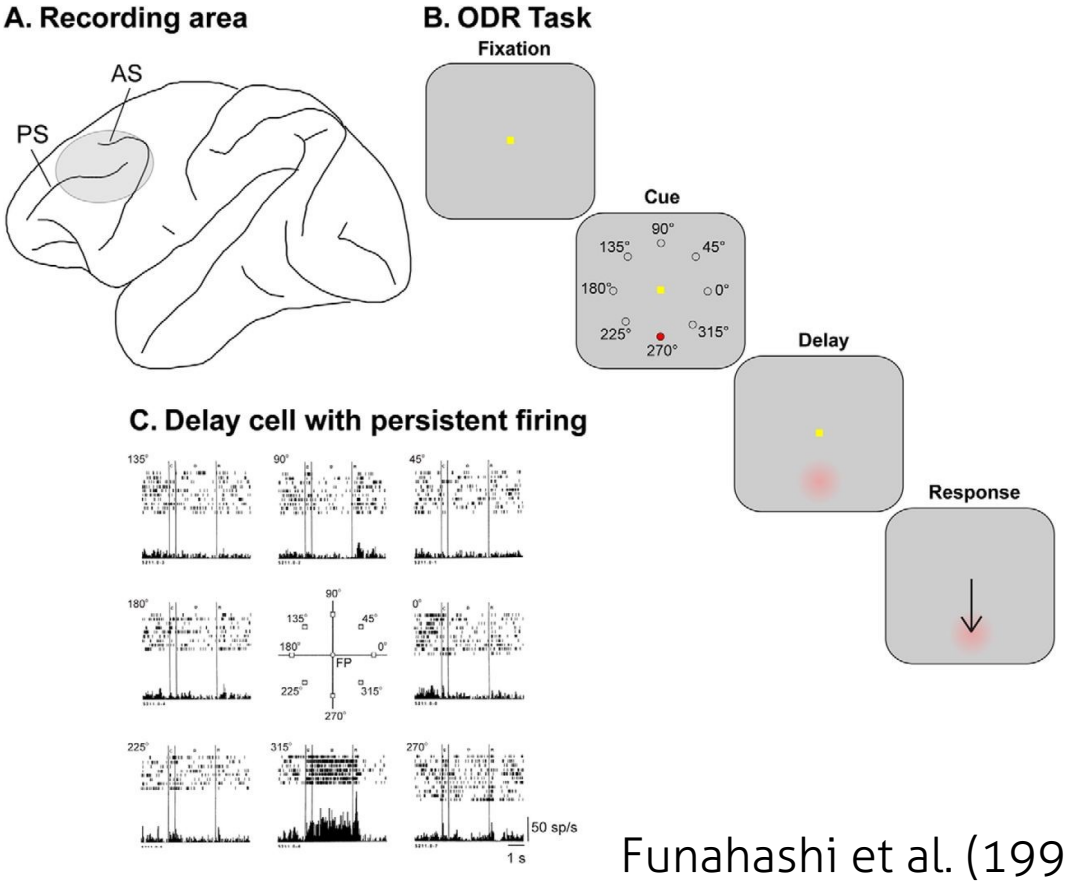
Network motifs

Sustained activity



excitatory feedback (amplification/ sustained activity)

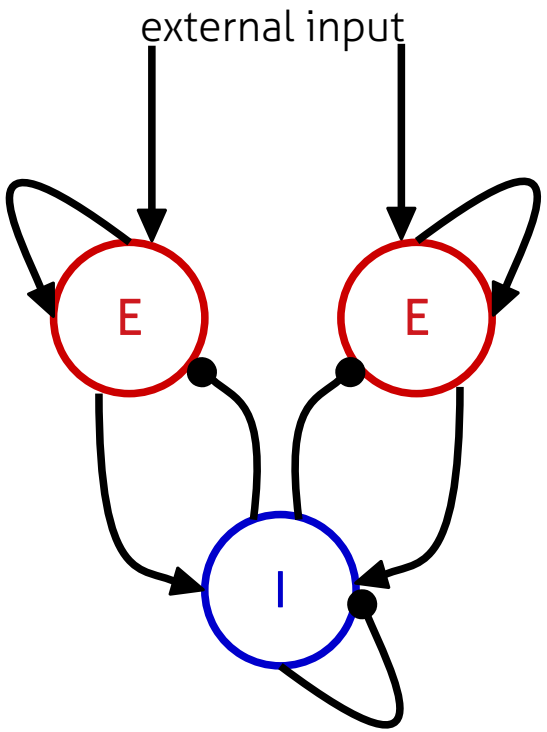
inhibitory feedback (stabilization, prevent runaway activity)

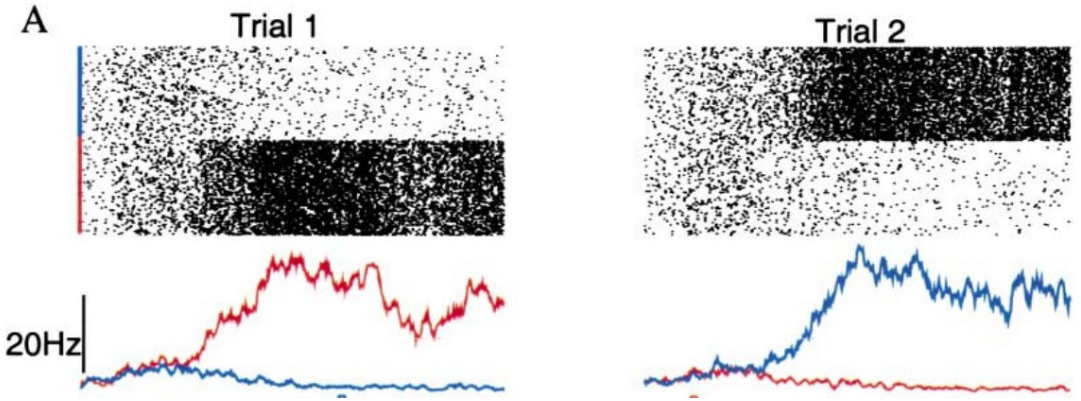


Funahashi et al. (1998)

Network motifs

"Winner-takes-all"





Wang (2002)

Project

Code to get started (for all links go to: *https://frama.link/brian-tutorial*):

- https://github.com/brian-team/brian-material/tree/master/2020-08-Brian-online-tutorial/project

Things to explore

- Switch off the stimulus after the end of the simulation and continue the simulation
- Connect the neurons among each other with synapses. Can you get sustained activity after the stimulus switches off?
- Instead of connecting all neurons to all other neurons, connect them preferrably (or with stronger weights) to neurons with similar stimulus preference.
- Introduce an inhibitory population and connect it to the excitatory population
- Add a second stimulus or change the stimulus over time
- Be creative!