Msc thesis
Mathematical Modelling and Computation

# The dynamics of adaptive neuronal networks: influence of topology on synchronisation

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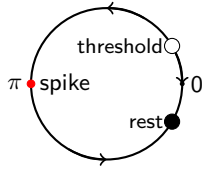
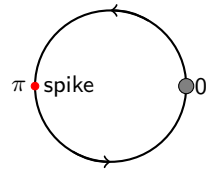
# Introduction

# The Theta Neuron Model

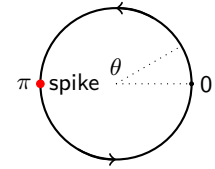
- SNIC bifurcation




Excitable regime: $I < 0$

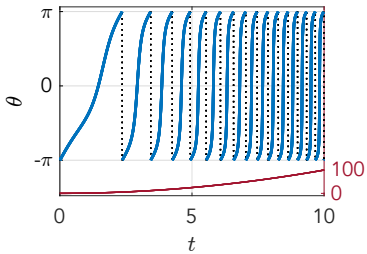


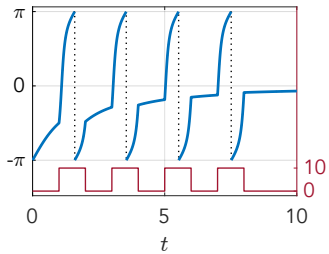

Bifurcation: $I = 0$

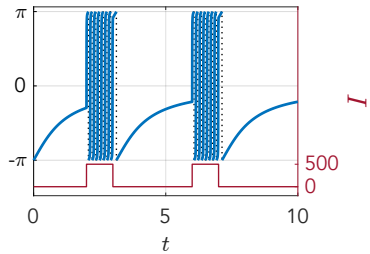



Periodic regime: $I > 0$

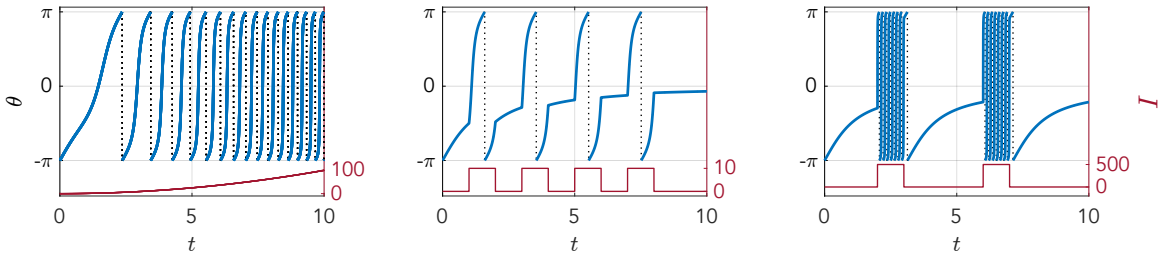
Features of the model



# The Theta Neuron Model



# Network Topologies

# Mean Field Reductions

## *Investigation:* Mean Field Reductions for undirected graphs

# Hebbian Learning and Synaptic Plasticity

# *Investigation:* Emerging Network Topologies

# Conclusion and Discussion