APMA 1930N
Outline

Ankan Ganguly

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1 Replicating the Paper

- Truthful replication, why it failed (Integrate and fire)
- Discussion about rates, learning parameters
- Sensitivity analysis on rate, learning parameters (rin, η, ϵ)
  Assume that optimal

$$WW^T = w_{max}^2 I$$

  Then we can define an error function by

$$Err(W) = E[WW^T] = \sum_{i \neq j} (WW^T)_{ij} + \sum_{i=1}^{N} [w_{max}^2 - (WW^T)_{ii}]$$

  Plot 1:
  rin vs $Err(W)$ with different curves for each value of $\eta * \epsilon$
  Plot 2:
  Fix rin_{best} and $(\eta * \epsilon)_{best}$ and vary ϵ.
  Plot 3:
  Fix rin_{best} and $(\eta * \epsilon)_{best}$ and vary η.
  Extrapolate W_e as the matrix satisfying $Err(W) = 0$ which is closest to W.
  Run stability testing and possibly add some more plots.
  Add potential plots and bursting for various parameters to test firing chains.
- Intuition behind sensitivity
- Intuitive explanation
- Synchrony in this model (Find experimental paper about songbird)
- Quick analysis of binary model

2 BCM