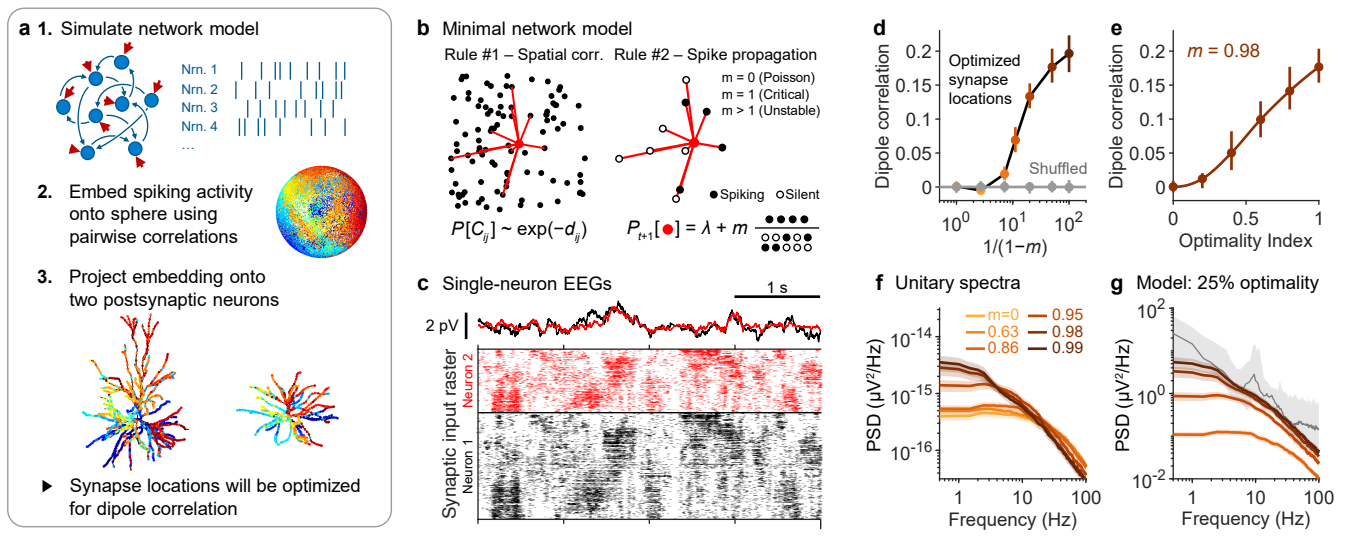
a 1. Simulate network model
Nrn. 1
Nrn. 2
Nrn. 3
Nrn. 4
…
2. Embed spiking activity onto sphere using pairwise correlations
3. Project embedding onto two postsynaptic neurons
Synapse locations will be optimized for dipole correlation
b Minimal network model
Rule #1 – Spatial corr.
Rule #2 – Spike propagation
m = 0 (Poisson)
m = 1 (Critical)
m > 1 (Unstable)
Spiking
Silent
P[C_ij] ~ exp(−d_ij)
P_t+1[●] = λ + m
c Single-neuron EEGs
1 s
2 pV
Synaptic input raster
Neuron 2
Neuron 1
d
Dipole correlation
Optimized synapse locations
Shuffled
1/(1−m)
e
m = 0.98
Dipole correlation
Optimality Index
f Unitary spectra
m=0
0.63
0.86
0.95
0.98
0.99
PSD (μV²/Hz)
Frequency (Hz)
g Model: 25% optimality
PSD (μV²/Hz)
Frequency (Hz)