Lab T

Bayesian Filtering

Bonus

The opening of a channel is a stochastic process. Our model is based on Markov chain, which is a stochastic process with Markov property - future state of a channel is only dependent on the present state, independent of any past states.

Repeated observation of data = 0.5 adds little information about the opening (1) or closing (0) probability of a channel. This leads to a steady state where the Markov chain is described by the time-independent transition matrix p and the vector pi. Since pi contains the information about the steady state posterior PMF, we wish to calculate it.

Pi = Pi*p

1*pi=pi*p → this implies that pi is a left eigenvector of p that corresponds to the eigenvalue 1.

After solving for the eigenvector that corresponds to eigenvalue = 1, we end up with pi = [.1189, .0595, .9911]

This is the steady-state posterior PMF (what we get after observing data = 0.5 infinite number of times)