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Estimating Network Properties of the Adult Song Production Pathway

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To analyze networks of neurons and predict their behavior with new stimuli, one must estimate the parameters of the network, including properties of the neurons at the nodes and the properties of the synaptic connections. One is always provided with sparse data, and from this one must estimate both the parameters and the full state of the system in order to make predictions. We will discuss methods for achieving this in both a deterministic and a probabilistic setting, and address how to succeed in developing the song production networks from electrophysiological data.