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Spike-sorting for small circuit networks

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Spike-sorting primer

Spike-sorting is the process of mapping action potentials to the originating cell.
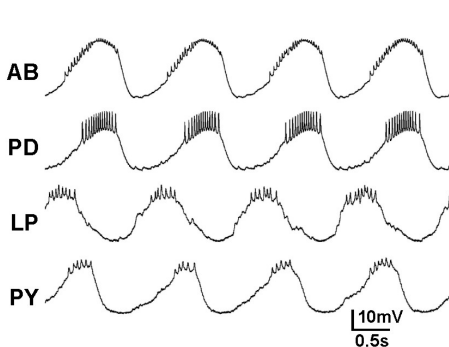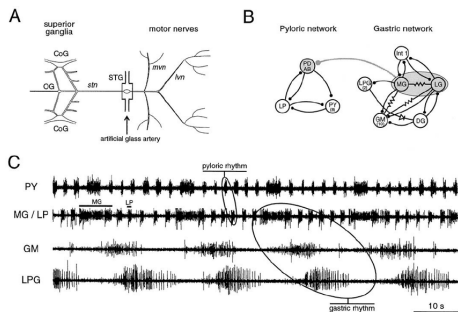

Figure: Intracellular recordings of pyloric cells.

Figure: **A** circuit diagram of nerves; **B** connectivity diagram, circles are cells, synapses are lines and dots; **C** extracellular recording of motor nerves.

How to sort spikes

1. Identify spikes from membrane potential waveform (easy)
2. Sort spikes using some magic algorithm (hard)

For large networks, spike sorting means:

1. Methods: PCA, SVD, stochastic k-means matching of correllograms
2. Data: 100s of channels but without a ground truth

For small networks, spike sorting means:

1. Methods: dimensionality reduction, machine learning
2. Data: few channels with known activity

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Dimensionality Reduction

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