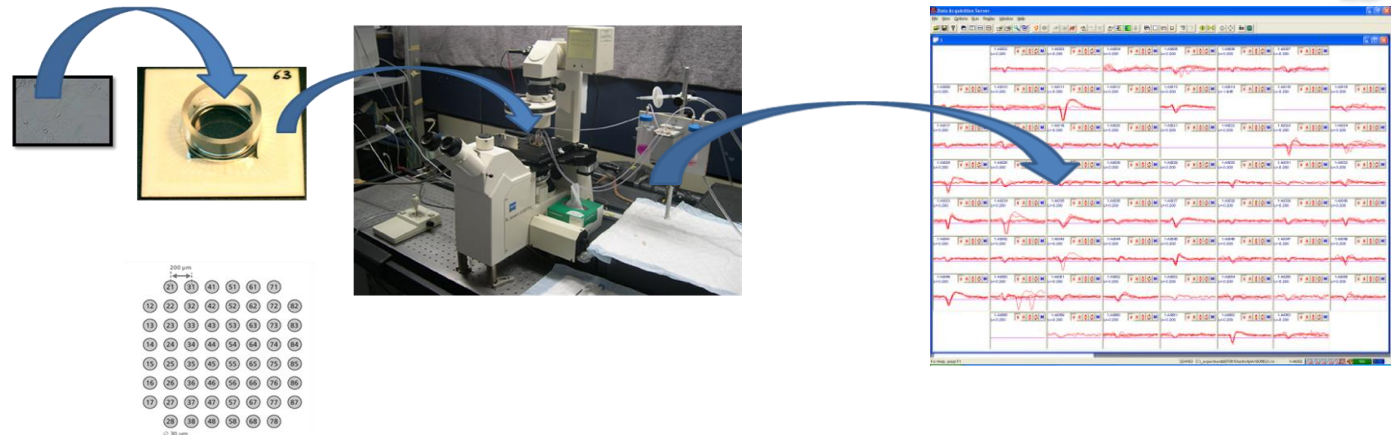




The Lorry I. Lokey Interdisciplinary Center
for Life Sciences and Engineering

NETWORK BIOLOGY RESEARCH LABORATORY

TECHNION Department of Electrical Engineering



Toward Synchronization in Neural Networks

Introduction:

A common technique for recording neuronal data from a population of neurons involves the use of multi-electrode arrays (MEA). One drawback of this technique is that the signals acquired cannot be directly assigned to single cells. However, many types of neuronal data analysis require the precise information of single neurons' spiking times. The process of extracting this information from MEA recordings is known as spike sorting. Spike sorting poses engineering challenges in the areas of signal processing, feature extraction and pattern classification.

Prerequisites:

- Introduction to digital Signals Processing – a must
- Programming experience in Matlab – a must
- Introduction to Biological Signals and Systems - preferably

Project Description:

The project will include analyzing a multichannel time series which include an electrical activity of tens of nerve cells in an active network. This analysis will include spike sorting and source separation and finding predicament measurements to the happening of synchronization in a neural network.

This project has possible implications on understanding and predicting of the synchronization phenomena at complex neural networks.

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