

# Neuromechanics Lab

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EE11B053

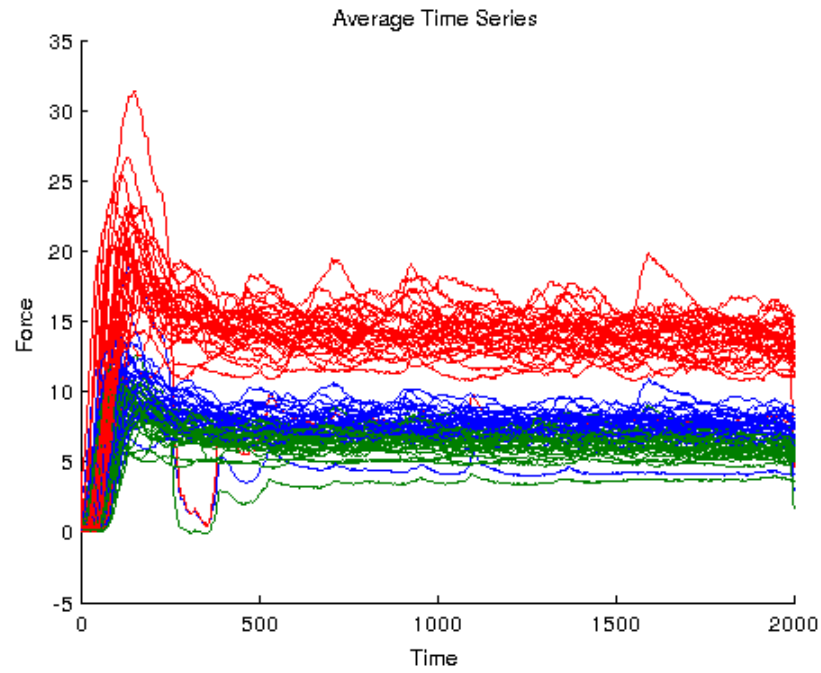
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Objective: Calculate the covariance of the forces between the index and the middle fingers. This gives an idea of the dependence between the forces of the index and the middle fingers.

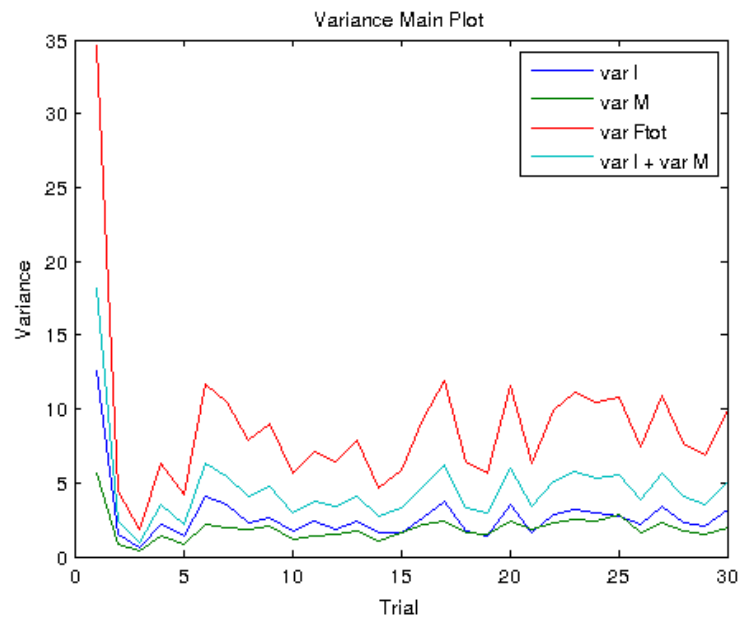
Experimental Data: The experiment consisted of measuring the force exerted by the index and the middle fingers in 30 trials of 10 seconds each. The subjects were requested to apply close to 10N. The resulting data consisted of 30 trials of 2400 data points each. We also calculate the total finger force for each data point .

## Analysis:

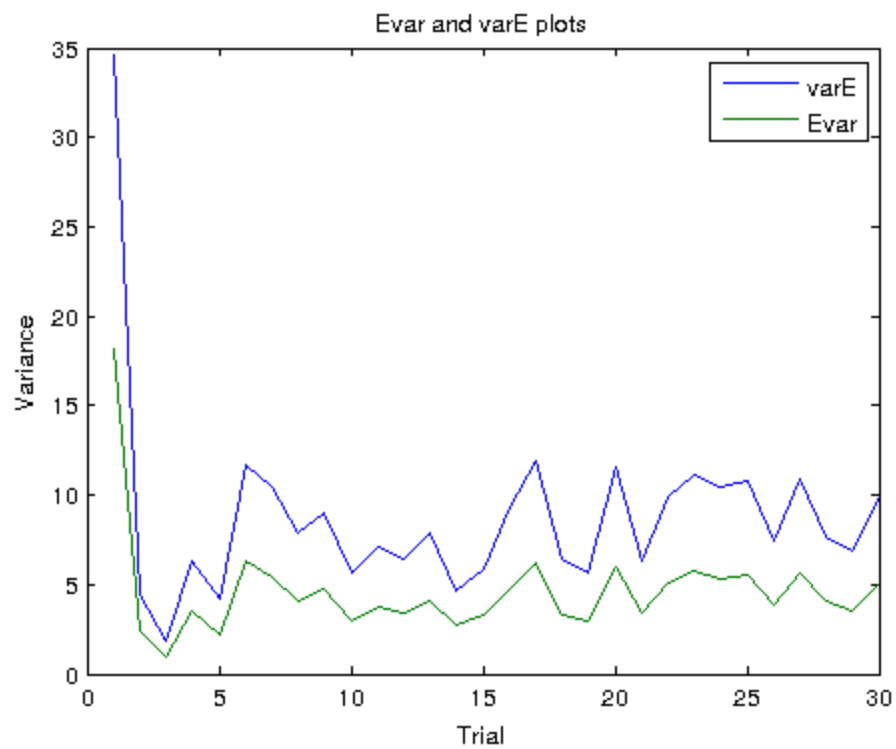
- The first step consisted of cleaning up the input data by calculating the average of the first 400 data points of each trial and subtracting that from the remaining 2000 data points. After this, we discard the first 400 data points of each trial. We plot all the trials in one graph (Plot 1).
- The next step consists of calculating the variance of each trial. We calculate the variance of the individual finger forces, the total force, and the sum of the variances of the finger forces. This is shown in plot 2 and plot 3.
- After that, we calculate the covariance. (Plot 4)



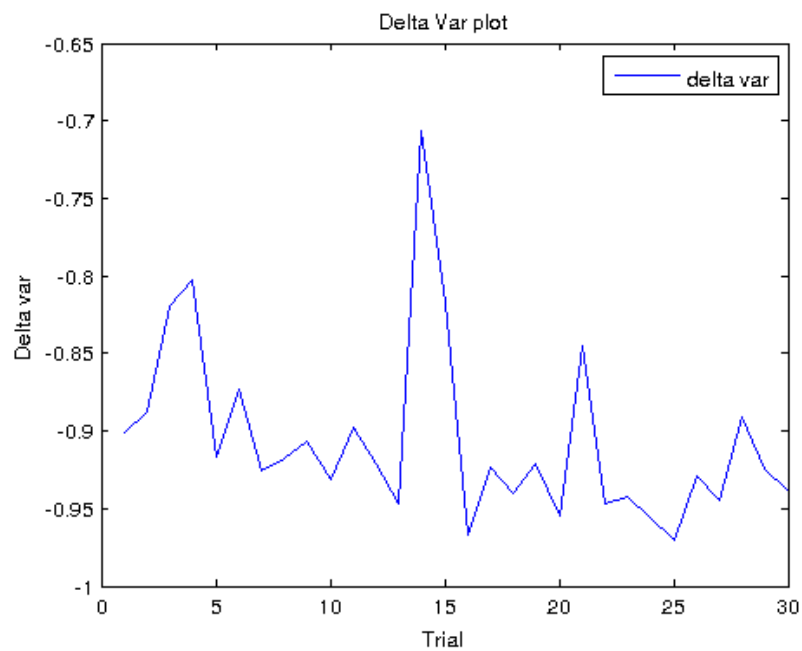
(Plot 1: The average time series. Red - Total finger force, Blue - Index finger, Green - Middle finger)



(Plot 2: Variances)



(Plot 3: Evar and varE)



(Plot 4: The covariance)