CS 736

Assignment 1

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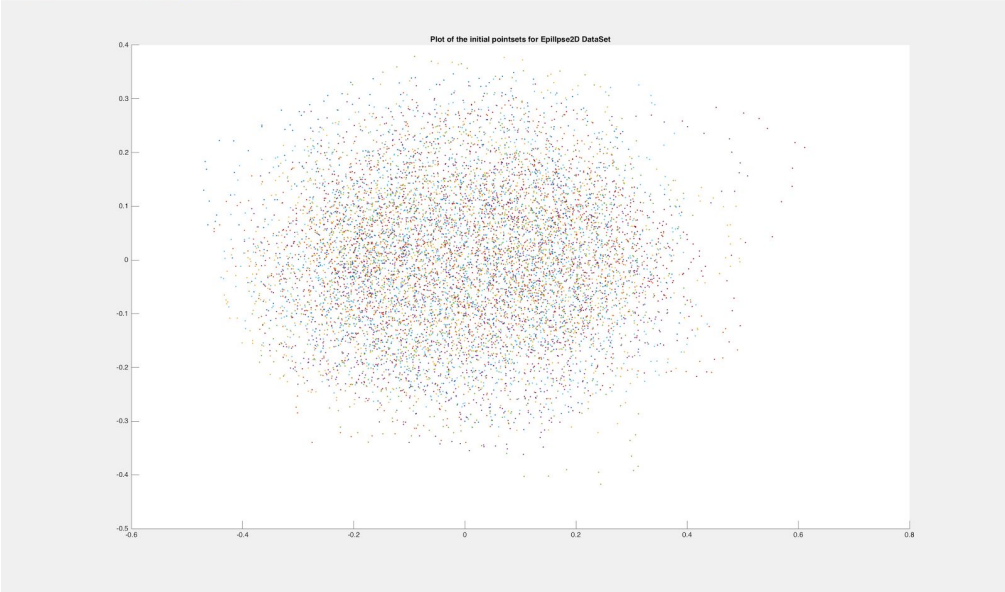
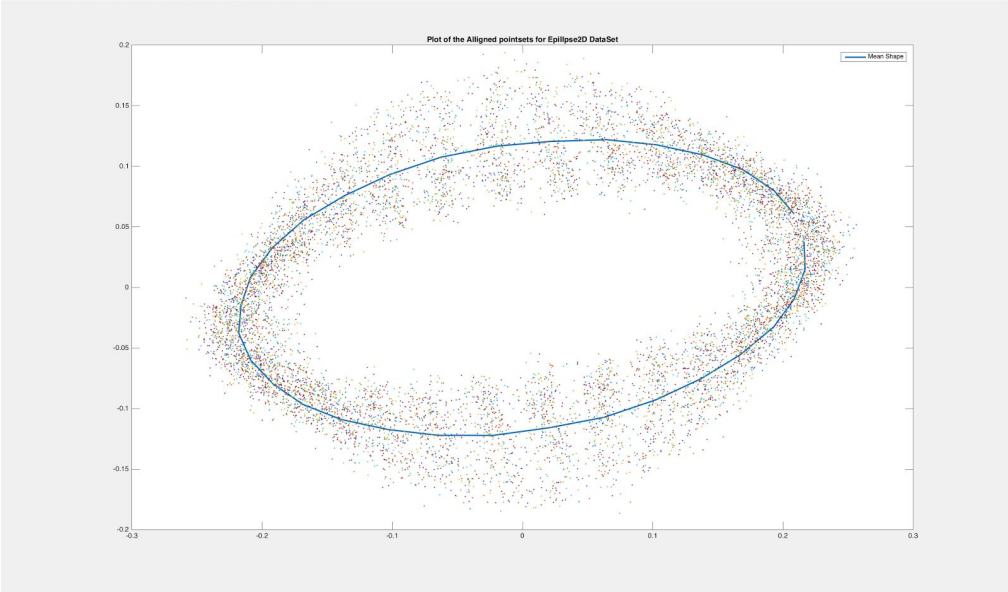
25th January, 2018

Question 1 : Ellipse

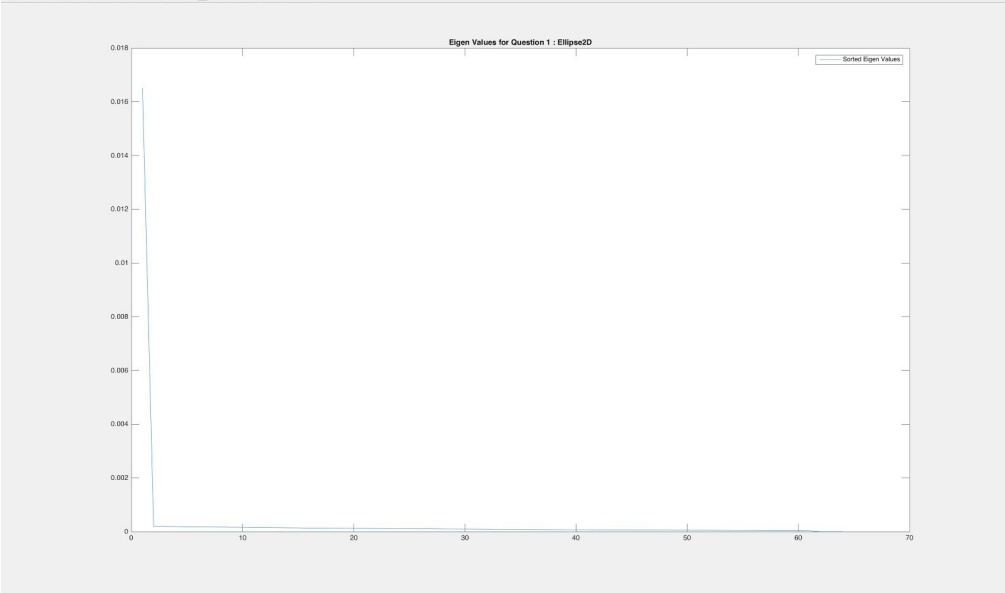
a) Ellipse Pointset (Not Aligned)



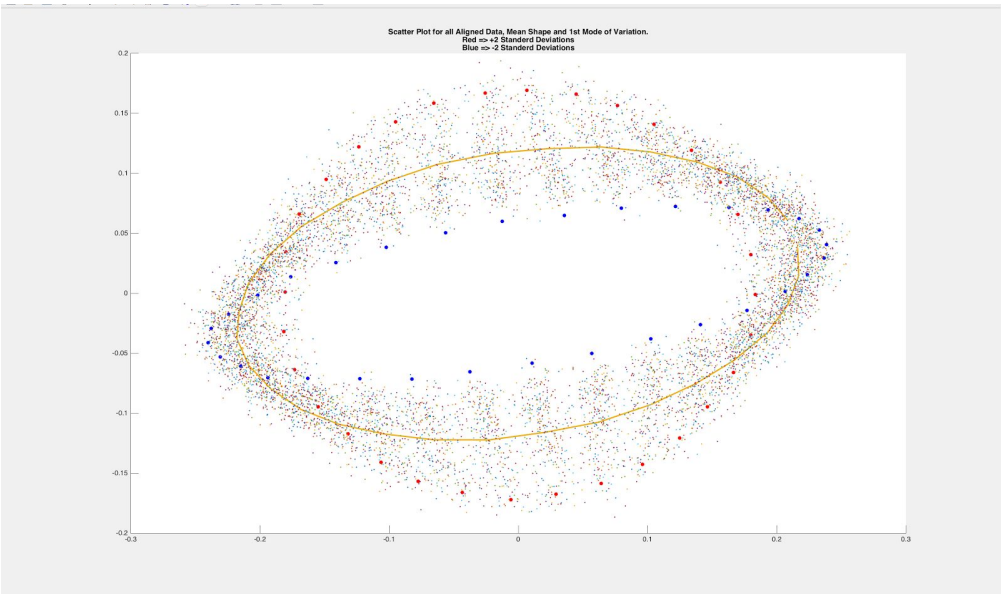
b) Ellipse Pointset (Aligned) and Mean Shape of the



c) Eigenvalues along each Principal Mode of Shape Variation



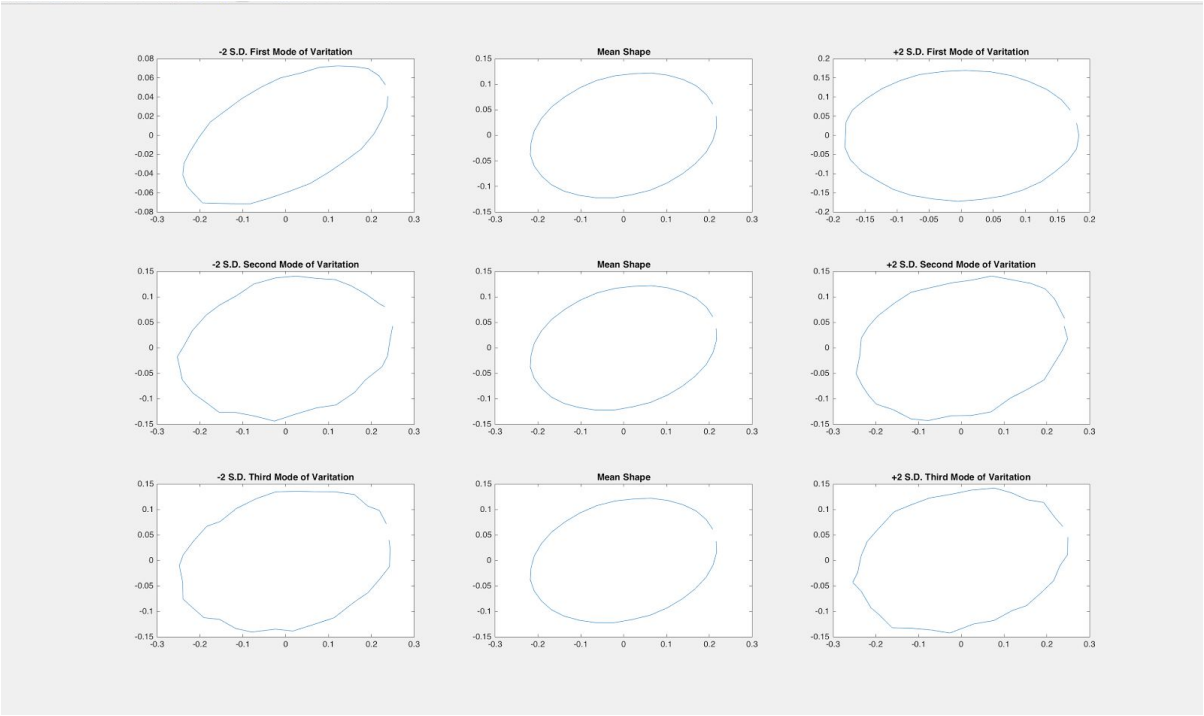
d) Computed Mean, All aligned pointsets, +2 S.D. and -2 S.D.



Yellow Line : Mean

Blue Dot : -2 Standard Deviations about Principal Mode of Variation

Red Dot : +2 Standard Deviations about Principal Mode of Variation



Row 1 : First Principal Mode of Variation

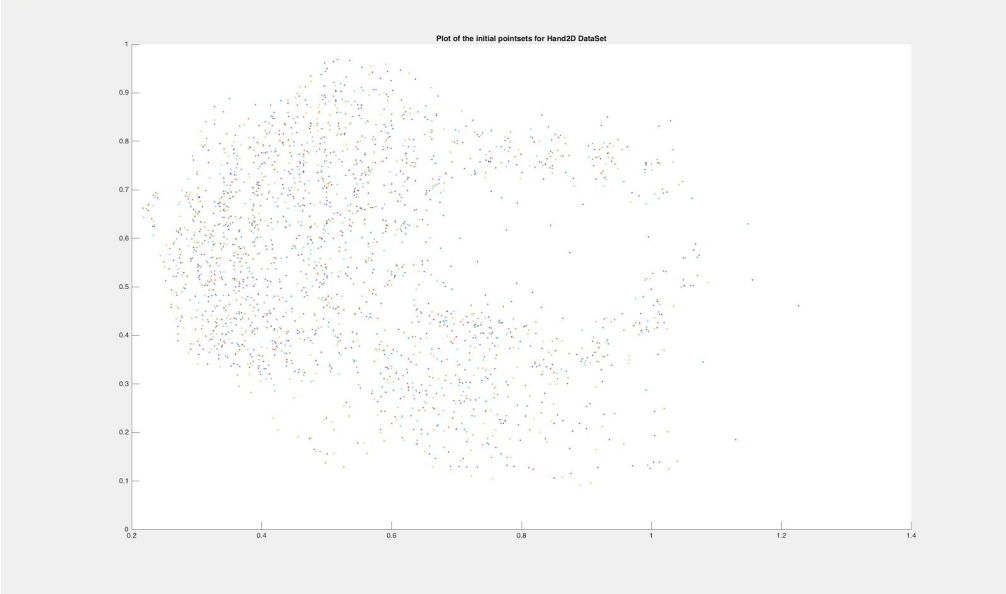
Row 2 : Second Principal Mode of Variation

Row 3 : Third Principal Mode of Variation

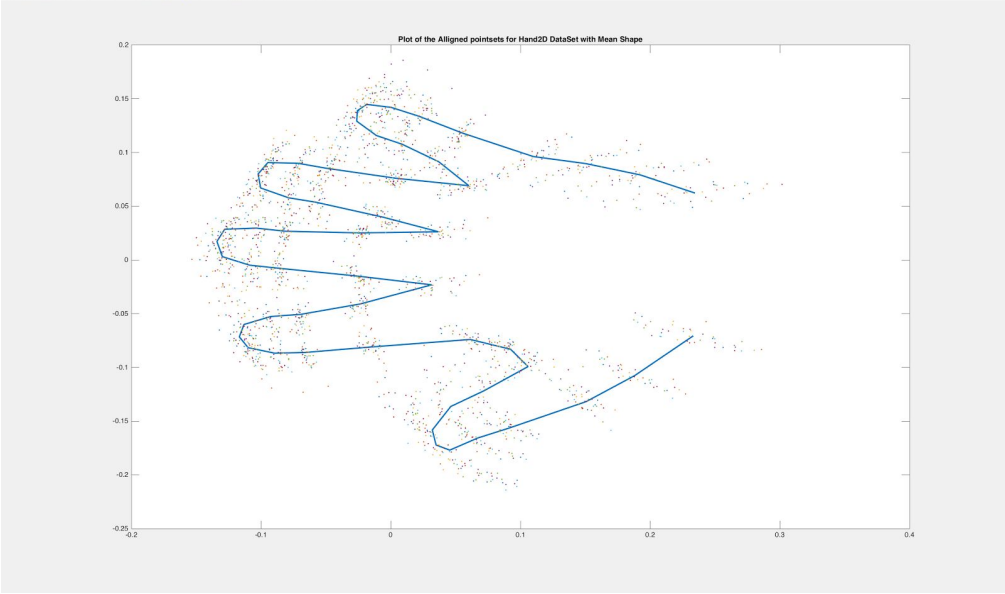
NOTE : After the Third Mode of Variation, the Eigenvalues become very small and hence the plot of ± 2 S.D. about mean almost overlaps with the mean and hence is insignificant.

Question 2 : Hand

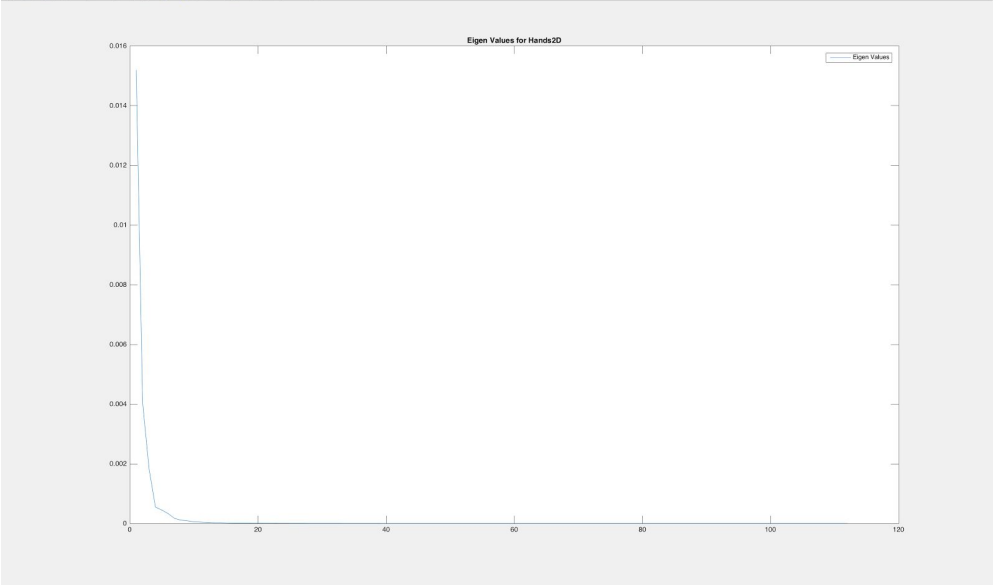
a) Hand Pointset (Not Aligned)



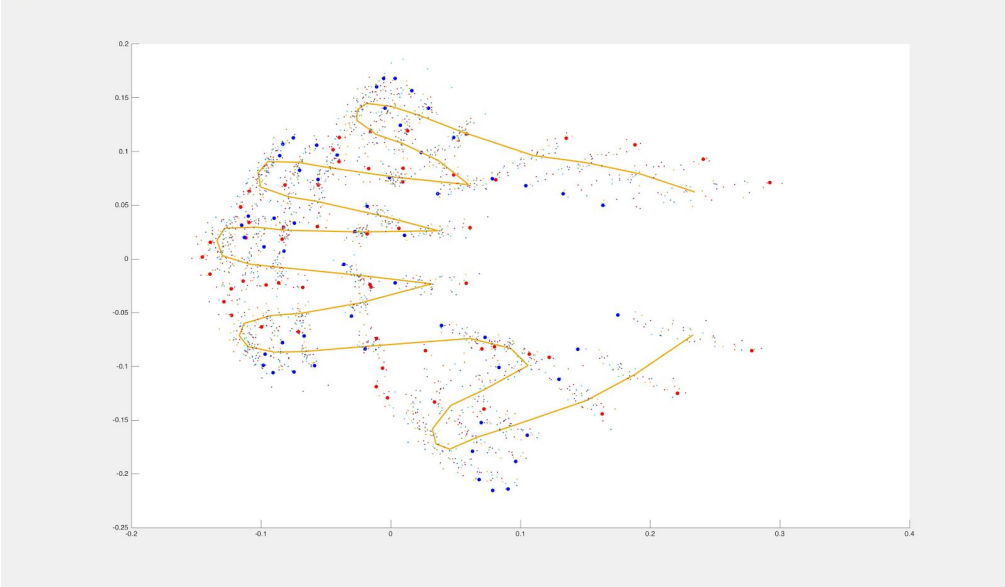
b) Hand Pointset (Aligned) and Mean Shape of the



c) Eigenvalues along each Principal Mode of Shape Variation



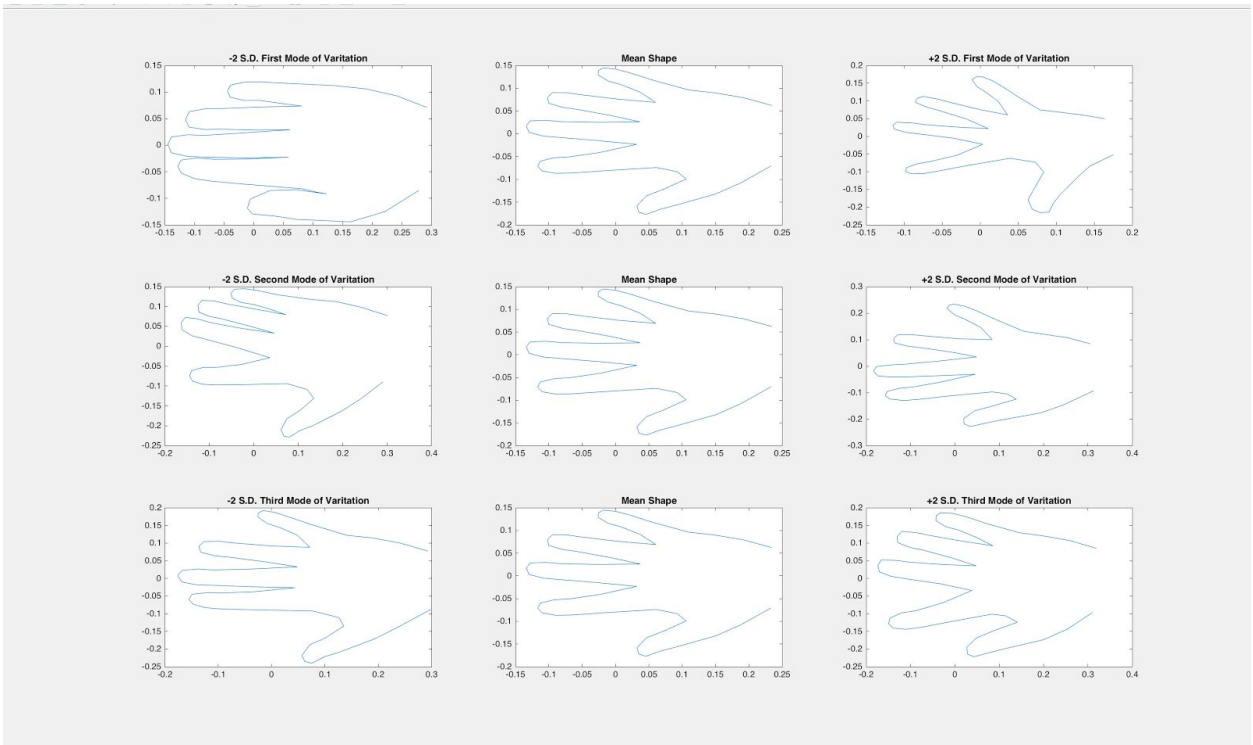
d) Computed Mean, All aligned pointsets, +2 S.D. and -2 S.D.



Yellow Line : Mean

Blue Dot : -2 Standard Deviations about Principal Mode of Variation

Red Dot : +2 Standard Deviations about Principal Mode of Variation



Row 1 : First Principal Mode of Variation

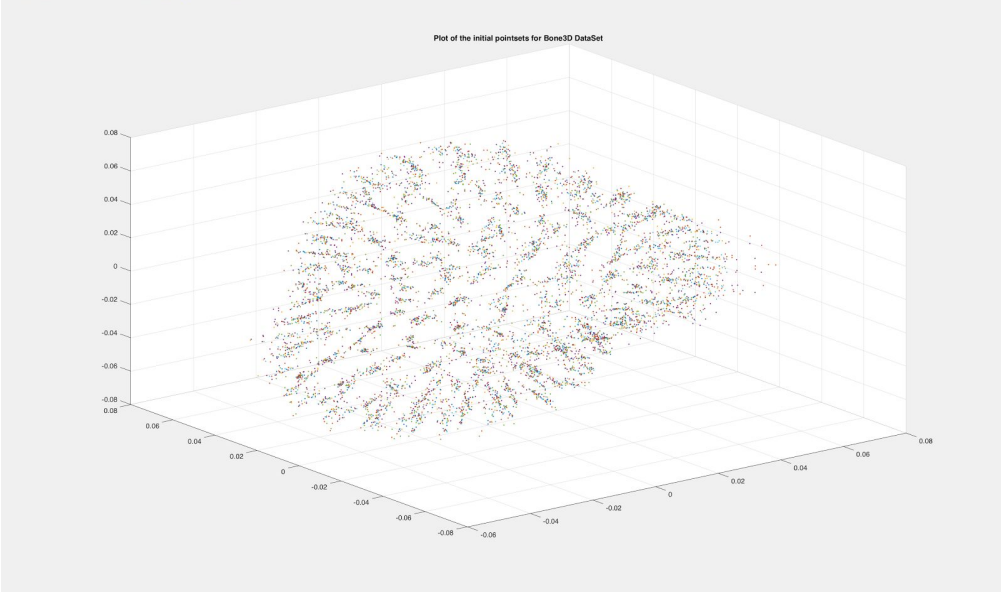
Row 2 : Second Principal Mode of Variation

Row 3 : Third Principal Mode of Variation

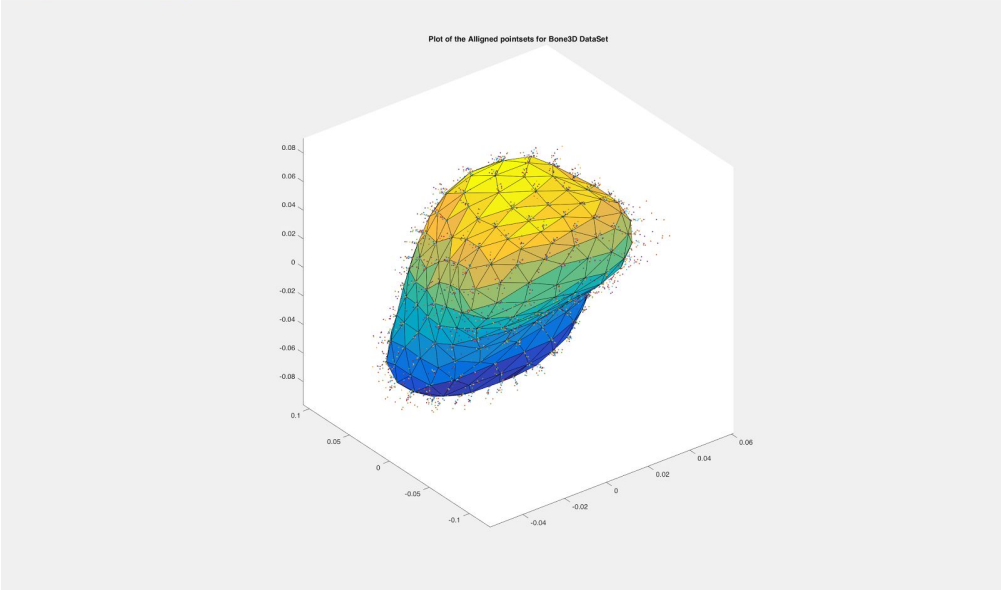
NOTE : After the Third Mode of Variation, the Eigenvalues become very small and hence the plot of ± 2 S.D. about mean almost overlaps with the mean and hence is insignificant.

Question 3 : Bones

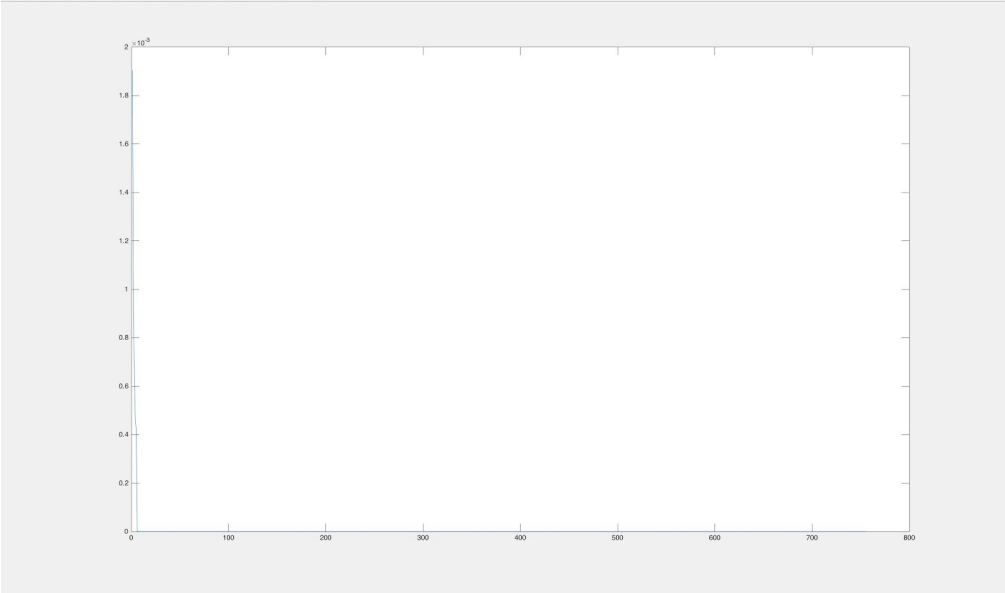
a) Bone Pointset (Not Aligned)



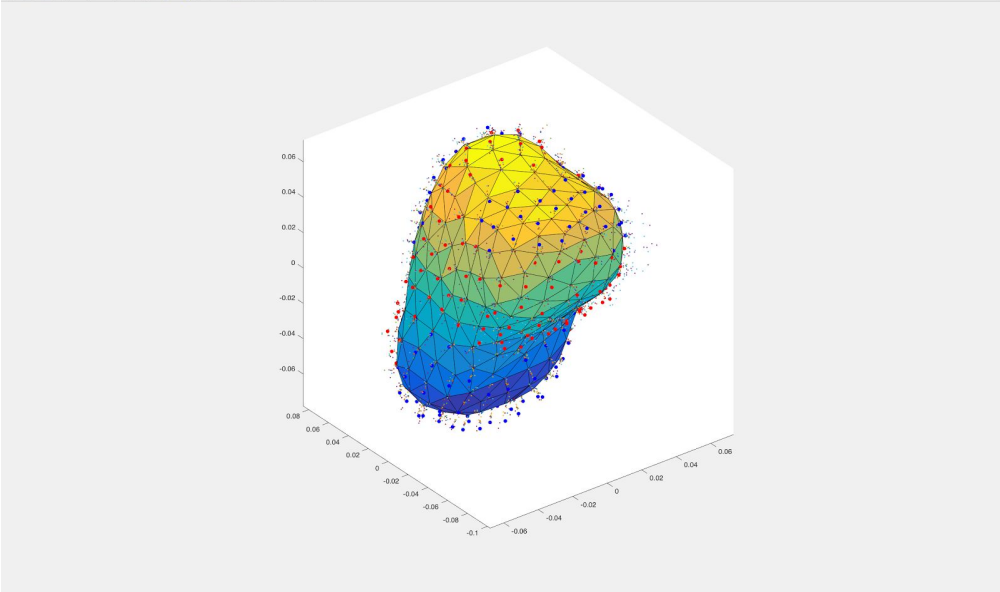
b) Bone Pointset (Aligned) and Mean Shape of the



c) Eigenvalues along each Principal Mode of Shape Variation



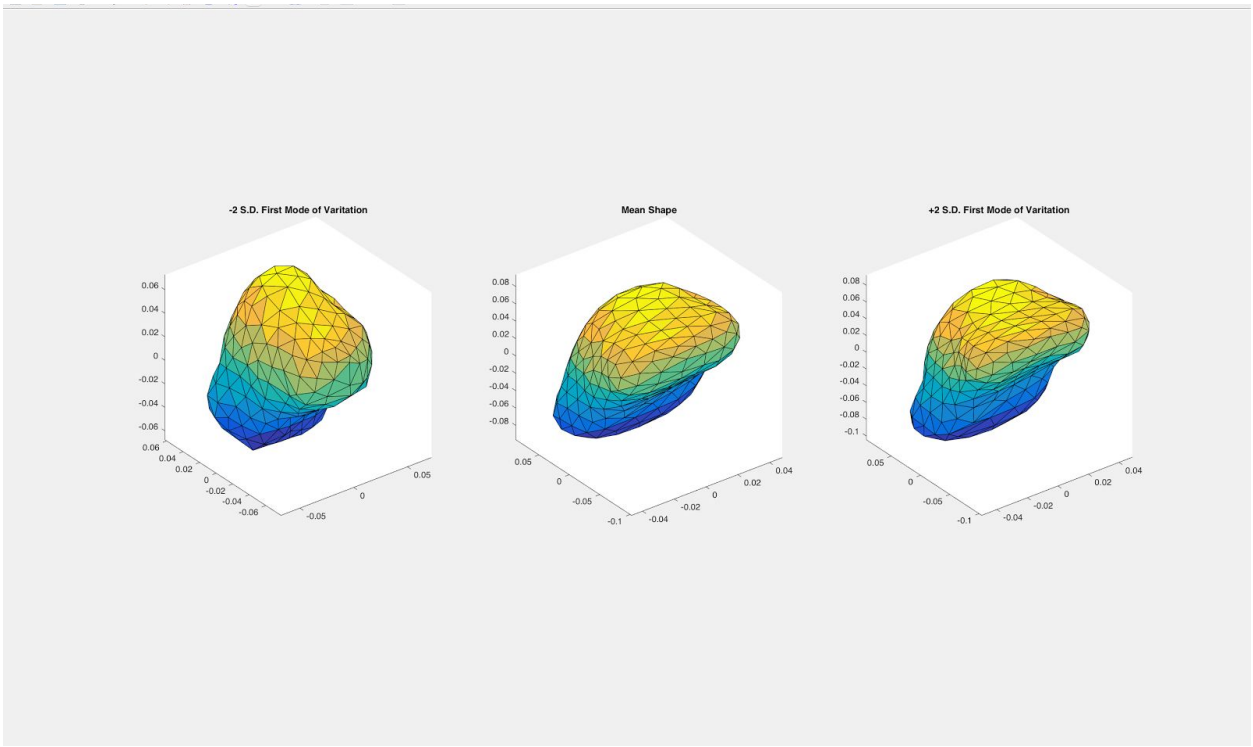
d) Computed Mean, All aligned pointsets, +2 S.D. and -2 S.D.



Surface : Mean

Blue Dot : -2 Standard Deviations about Principal Mode of Variation

Red Dot : +2 Standard Deviations about Principal Mode of Variation



Plot 1 : - 2 Standard Deviations from Mean

Plot 2 : Mean

Plot 3 : + 2 Standard Deviations from Mean