

# Exercise in Computer Aideded Medical Procedures II (Validation)

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The data set “normtemp.csv” contains body measurements for 130 healthy, randomly selected individuals. The variable temperature contains normal body temperature data and the variable gender contains gender information, with male coded as 1 and female as 2. First split the data by gender, and then perform a two-sample (paired) test to see whether the population means are equivalent. Is the difference statistically significant? [1]

The “galton.csv” data set contains data collected by Francis Gallon in 1885. Each data point contains a child’s height and an average of his or her parents’ heights. Do a t-test to see if the mean height of children is smaller than that of his or her parents. Assume the paired t-test is appropriate. What problems are there with this assumption? [1]

Using matlab generate one vector of 100 random Gaussian values with mean=0 and std=1 and a second vector of random Gaussian values with mean=0.3 and std=1. Assume the samples of the first vector belong to the class positive and the second vector class negative. Apply a threshold of 0.15 and classify the samples and then compute the accuracy, sensitivity, and specificity of the classifier.

Create two vectors of 100 random Gaussian values with mean =0 and std=0.5. Depict the bland-altman plot and the boxplot of the error.

Load image “vessel.png” and apply the Frangi filter to get an enhanced image. Compute the SNR.

Compute the Dice value between the extracted regions in image 1, image 2 and image 3.

you may find these functions of matlab helpful for completing this exercise: randn, ttest

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[1] John Verzani, Using R for Introductory Statistics, Chapman & Hall/CRC