Sheet 2

Sample Variance and Lab Experiment

Ahmet Can Ademoglu Luca Dietrich Felix Wersing

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TU Dortmund – Fakultät Physik

Exercise 29 - Sample Variance

a) Arithmetic mean - Bias

In this part of the task the arithmetic mean:

$$\overline{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$$

gets tested to be unbiased.

b) Standard Error

$$E((\overline{X} - \mu)^2) = \mathrm{Var}(\overline{X}) = \frac{\sigma^2}{n}$$

c) Bias test - S_0^2

$$S_0^2 = \frac{1}{n} \sum_{i=1}^{n} (X_i - \mu)^2$$

d) Bias test - $S_1'^2$

$$S_1'^2 = \frac{1}{n} \sum_{i=1}^{n} (X_i - \overline{X})^2$$

Exercise 30 - Lab Experiment

a) Measurements

b) Covariance matrix

c) Error and Correlation