



Universität Stuttgart

Institute for Modelling and Simulation
of Biomechanical Systems

Bachelorthesis
Term paper
Masterthesis

Implementation of a holistic decision model of statistics in Matlab

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Background

Do you want to apply your knowledge of statistics to real data and implement a holistic statistical analysis in Matlab? Then you've come to the right place. The IMSB generates large amounts of data, both experimental and simulated. This data requires statistical analysis to see if deviations in the results are statistically significant or just due to chance.

Problem

Various variables are calculated from the generated data. These must be statistically evaluated in order to detect changes. Since different data formats and distributions are involved, it is necessary to create a Matlab environment that imports the data, analyses it in terms of distribution and then selects the appropriate test according to predefined criteria such as dependence and significance level. In addition, a suitable post-hoc analysis must be implemented. Ideally, the model can then be used in a graphical user interface (GUI).

Tasks

- Literature research regarding the correct model assumption
- Implementation of the models in Matlab
- Complete model with case decision
 - (normal distribution, distribution-free, variable scaling...)
- Post-hoc analysis
- Validation
- (GUI)

Requirements

- Statistical knowledge
- Programming experiences (Optimally previous knowledge of Matlab)
- Independent and creative way of working
- Very good knowledge of German and English

Knowledge gain

- Working with real experimental data sets
- Developing a holistic modelling approach
- Working with Matlab software, GUI if possible
- Interaction in a scientific context
- Scientific work