INF

FAKULTÄT FÜR
INFORMATIK

Master-level seminar & teamproject: Topics

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Teamproject (Master degrees only)

Prerequisites:

- A team of THREE students
- GOOD software engineering skills
- Background in data mining / machine learning
- Familiarity with statistics

M-DKE new: teamprojects belong to “Applied Data Science” **only**

MLM_t: Multi-Level Modeling for an mHealth study

Goal of this teamproject is the design and implementation of an environment for MLM (3-level) analysis on mHealth data. The teamproject encompasses the following:

- TASK 1: Exemplary tool, based on the multi-level model of Probst et al (2017)
- TASK 2: Data management utility for a collection of mHealth data
- TASK 3: Preparation utility for a stream of mHealth data, including removal of recordings with missing values
- TASK 4: Baseline-demonstrator that fits the model of Probst et al (2017) on a new dataset (prepared as of TASK 3)
- TASK 5: Extension of the baseline-demonstrator with a method that deals with missing values
- TASK 6: Evaluation protocol and report of the findings for Tasks 4 and 5, including statistical testing

PREREQUISITES:

1. Data management
2. Software engineering in Python on R
3. Familiarity with MLM (cf. seminar)

T. Probst, R. Pryss, …, J. Zimmermann. *Does tinnitus depend on time-of-day? An Ecological Momentary Assessment Study with the "TrackYourTinnitus" Application*, Frontiers in Aging Neuroscience, Aug 2017, https://doi.org/10.3389/fnagi.2017.00253

MLM_s: Seminar topics on multi-level modeling

This is a seminar assignment for **self-learning**:

1) Read the first 8 chapters of the book of Singer & Willet (2003)
2) Discuss how the simple MLM of chapter 4 can be applied on the data of Probst et al (2017) and elaborate on limitations
3) Elaborate on how Probst et al (2017) modeled TIME, considering the perspectives of chapter 4, chapter 5 and chapter 6
4) Interpret the findings of Probst et al (2017) using the methods of chapters 7 and 8

Suggest one paper that extends the MLM of Singer & Willet (2003) with respect to:

5) Correction for multiple testing (cf. Chapter 4, esp. section 5)
6) Dealing with missing values

DELIVERABLE: Report with (1) discussion on items 2, 3, 4 and (2) a solution on either item 5 or 6.

J. Singer, J. Willet. *Applied Longitudinal Data Analysis – Modeling Change and Event Occurrence*, Oxford University Press, 2003

T. Probst, R. Pryss, …, J. Zimmermann. *Does tinnitus depend on time-of-day? An Ecological Momentary Assessment Study with the "TrackYourTinnitus" Application*, Frontiers in Aging Neuroscience, Aug 2017, https://doi.org/10.3389/fnagi.2017.00253

Warning

You cannot pass this seminar if any of the following holds:

1. You do not understand the contents of the book and papers you read.
2. You cannot describe what you read to others with your own words.
3. Your claims are not substantiated / not supported by sound evidence.
4. Your texts contain quotations from the book / papers to more than 25% of written text total.

Thank you very much!

Questions ?