Preface

This document will accompany during the course. All the logistical details are given in the beginning and then there are few pages for each session. Sometimes they complement slides and sometimes they stand alone.

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Logistics

Welcome to the course on advanced data analysis with R. Over the next 12 sessions we will revise spatial data, random variables and linear models.

Cover some more programming and package development with R. Introduce you to time series and mixed effects models.

Instructors:

- Sebastian Hanss (programming in R)
- Kai Husmann (time series data)
- Johannes Signer (jsigner@uni-goettingen.de; all other topics)

If you have any questions, feel free to get in touch whith us.

When and where:

Most Wednesdays during term (see schudule) from 8:45 to approx. 11:45 in FSR 3.1.

What you need

Please bring your own laptop with a current version of R and RStudio and ideally git.

Exam

After the term there will be a 20 min oral exam. You are asked to present one of the exercises (assigned to you at random) and we will talk about the exercise and the course.

Schedule

Our tentative schedule is as follows:

Session	Topic	Who
1 (16. 4)	Getting started, working with spatial data in R	Johannes
2 (23.4)	Programmin in R, loops, functions, git	Sebastian
3 (30.4)	Random variables and statistical distributions	Johannes
4 (7.5)	ML and Schools of inference (Bayes vs Frequentist)	Johannes
5 (14.5)	Linear Model (revision)	Johannes
6 (21.5)	Beyond the linear Model (GLMs and GAMs)	Johannes
- (28.5)	*Mid term*	
7 (4.6)	Time series analysis 1 (Data/ distributional properties, Stationarity)	Kai
- (11.6)	*Dies Academicus*	-
8 (18.6)	Time series analysis 2	Kai
9 (25.6)	Accounting for repeated measurements	Johannes
10 (2.7)	Time series analysis 3	Kai
11 (9.7)	Build your own R package, interacing with C++	Sebastian
12 (16.7)	Accounting for space and time in GLMMs and GAMs	Johannes