

Course "Resampling and Simulation"

- ▶ **Lecture and Project Work (2 + 1)**

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- ▶ **Planned schedule:**

1. In the first couple of weeks after Easter: Introduction to the topic (course with integrated R exercises)
2. Presentation of potential small research projects
3. Depending on your priority list, distribution into one of these projects
4. Group work: Preparing a research preprint under supervision
5. Each group gets an additional external expert
6. Interim presentation: early/mid June (depending on the expert's availability)
7. Final workshop presentation and preprint submission: end of September

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► Content of the Lecture:

- Introduction and Review of Statistical Inference Concepts and its Applications with R (if necessary)
- Why Simulations matter?
- Excursion: How and why to perform a Simulation Study
- Resampling: Concepts, Theory, and Simulated Performance
- Why Permutation and Randomization Tests stand out
- Guidelines for writing Research Papers

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- ▶ **Projects:** We envision around 4 projects which can still be made more precise after the first step. Potential topics may cover
 - Which (M)ANOVA to use for small samples?
 - How to impute missing values for valid inference in mixed effects regression?
 - Resampling for count-data or ordinal regression models
 - Analyzing the effect of outliers in longitudinal data analysis
 - ...
- ▶ **External Experts:** We are currently discussing with (and about) the following potential experts
 - Frank Konietzschke (Charité Berlin)
 - Sarah Friedrich (Augsburg)
 - Florian Dumpert (DESTATIS)
 - ...

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▶ Suitable Modules:

- Master Statistics: MS 6/ MS 7 (4.5 ECTS)
- Master Data Science: MD Applications (6 ECTS)
- Master Econometrics: ME 6 (6 ECTS)

▶ Language: English

▶ Prerequisites:

- Master Statistics: BSc degree in Statistics
- Master Data Science: passed MD 2: Statistical Theory
- Master Econometrics: passed ME1a: Statistical Theory

▶ Grading: Oral presentations and the responsible part of the research preprint

▶ Registration: Via moodle until March, 31.

The number of participants is limited and admission to the course will be according to the following order: 1. fulfilling the prerequisites; 2. field of study; 3. first-register basis.