

University of Cologne
Institute of Mathematics
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SS 2017: Concentration of measure

We will investigate concentration inequalities. One of the arguably most basic examples of a concentration inequality is e.g. Markov's inequality which you have seen in basic probability classes, and in probability theory II you might have gotten to know Doob's maximal inequality which can be considered a strengthening of Markov's inequality.

In different context very different types of such inequalities arise. They are very important in probability theory and exhibit rich connections to other fields of mathematics such as geometric analysis, functional analysis, statistical mechanics, and mathematical statistics.

We will cover selected topics of the book [BLM13] (seemingly available as an online resource in the UzK library).

The seminar is aimed at BSc and MSc students. Participants are expected to have ideally mastered the lectures 'Wahrscheinlichkeitstheorie I' and preferably also 'Wahrscheinlichkeitstheorie II' (in case of MSc students) also. In order to obtain the corresponding credit points, participants have to give a presentation on one of the available topics and actively contribute to the discussions of the remaining presentations.

Presentations can be given in English or German. At <http://www.alt.mathematik.uni-mainz.de/Members/lehn/le/seminarvortrag> you can find some advice on how to prepare a valuable seminar talk which you should take serious.

Students who intend to participate in the seminar are asked to notify the lecturer via email (see above) by **February 28th, 2017**, including

1. matriculation number,
2. semesters studied,
3. relevant lectures attended and grades obtained.

Room: Mathematics 204 (Seminarraum 2)

Day & time: Thursday, 10 to 11:30 a.m.

The preparatory meeting will take place on Monday, April 10th (details tba).

References

- [BLM13] Stéphane Boucheron, Gábor Lugosi, and Pascal Massart. *Concentration inequalities*. Oxford University Press, Oxford, 2013. A nonasymptotic theory of independence, With a foreword by Michel Ledoux.