

שם הקורס: הסתברות במימד גבוה ושימושים

מרצה: ד"ר עופר שייביץ

נקודות זכות: 2

דרישות קדם: חובה – אותות אקראיים ורעש. מומלץ - תורת האינפורמציה 1, תהליכים אקראיים.

תחום: תקשורת (1)

Title: Probability in High Dimension and Applications

Syllabus:

This course provides an introduction to modern techniques in the analysis of random structure in high dimensions, with an emphasis on applications in information theory, communications, statistics, random matrix theory, combinatorics, and learning. The course will cover a subset of the following topics, time permitting: Introduction and basic inequalities (Chernoff, Hoeffding). The concentration-of-measure phenomenon. Variance bounds and the Efron-Stein inequality. Information inequalities. Logarithmic Sobolev inequalities. The Entropy method. Concentration and Isoperimetric inequalities. The Transportation method: Marton's inequality, Talagrand's inequality. Influence and threshold phenomena. Suprema of random processes.

References:

1. *Concentration Inequalities*, S. Boucheron, G. Lugasi and P. Masart, Oxford University Press, 2013.
2. *Concentration of Measure Inequalities in Information Theory, Communications and Coding*, M. Raginsky and I. Sason. Foundations and Trends in Communications and Information Theory, 2014.
3. *Probability in High Dimension*, R. Van Handel, lecture notes, Princeton 2014.