Institute of Analysis and Number Theory

Mini-Series on Harmonic Analysis and Discrete Geometry. Lecture 1.

16.10.2018, 15.00-16.30

Seminarraum Analysis-Zahlentheorie, Kopernikusgasse 24, 2.OG

Star-discrepancy, Haar functions, and the small ball inequality

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The discrepancy function is one of the most standard tools designed to measure equidistribution of points in the unit square: it compares the actual vs. expected number of points in axis-parallel rectangles. Various norms of this function provide different information about the uniformity of a point distribution. Lower bounds for the discrepancy, which states that, no matter how one distributes points, their discrepancy cannot be too small, have come to be known collectively as quot;irregularities of distributionquot;. The methods of proof for such bounds most of the times arrive from harmonic analysis (e.g. Haar wavelets with product structure) and have been actively employed in the past by Roth, Schmidt, Halasz, Beck etc. We shall discuss these methods, known results and techniques, as well as connections of the problem to questions of harmonic analysis, probability, and approximation theory, which have been discovered more recently.

  This is the first lecture in a mini-series of four lectures. All lectures are independent and fully self-contained. No prior knowledge of any of the subject involved in the talk will be assumed.

P. Grabner, Ch. Aistleitner