מכון ויצמן למדע

THE WEIZMANN INSTITUTE OF SCIENCE

FACULTY OF MATHEMATICS AND COMPUTER SCIENCE

Geometric Functional Analysis and Probability Seminar

Room 155 ,Ziskind Building
on Thursday, Jan 03, 2019
at 13:30

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Patterns in Random Permutations

Abstract:

Every k entries in a permutation can have one of k! different relative orders, called patterns. How many times does each pattern occur in a large random permutation of size n? The distribution of this k!-dimensional vector of pattern densities was studied by Janson, Nakamura, and Zeilberger (2015). Their analysis showed that some component of this vector is asymptotically multinormal of order $1/\sqrt(n)$, while the orthogonal component is smaller. Using representations of the symmetric group, and the theory of U-statistics, we refine the analysis of this distribution. We show that it decomposes into k asymptotically uncorrelated components of different orders in n, that correspond to representations of S_k. Some combinations of pattern densities that arise in this decomposition have interpretations as practical nonparametric statistical tests.