The University of Chicago
Department of Statistics

BILLINGSLEY LECTURES ON PROBABILITY

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Large Deviations with Applications to Random Matrices and Random Graphs

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133 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

Title: We will apply large deviation theory to the problem of estimating the probability of having some very large eigenvalues in a random symmetric matrix. As an example we can calculate the probability of a random graph with each edge being on of off independently with probability p and $1 - p$. The number of triangles would be roughly $\binom{n}{3}p^3$. We estimate the probability of large deviations from this i.e. $\binom{n}{3}a^3$ with $a \neq p$ and answer the question of a graph conditioned to have a significantly different number of triangles would look like.