Rearrangements of the Simple Random Walk

Marina Skyers*, Penn State Brandywine, Lee J. Stanley, Lehigh University

In this talk we will look at representations of the simple random walk, $S_n$, and show how to effectively rearrange the sequence of terms $\frac{S_n}{\sqrt{n}}$ in order to achieve almost sure convergence to the standard normal on the open interval $(0,1)$. This is done via a suitable choice of permutation $F : \{0,1\}^n \rightarrow \{0,1\}^n$. We are interested in how much rearranging of the simple random walk is optimal. We will describe how to minimize the graph-theoretic complexity of these permutations and also show that they satisfy some additional nice properties.

Keywords: simple random walk, permutations, complexity