THE HEIGHT OF RANDOM TREES

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In this talk, we will present some work and results studying the height of random trees, more precisely random models of binary search trees. Binary search trees are a commonly used data structure in computer science; when used for data storage, their height corresponds to the worst-case number of steps required to access a piece of data stored in the tree. It turns out that randomization reduces the typical access time - and moreover, random binary search trees, the search trees built by using random numbers for the data keys, have many interesting mathematical properties.

In the first part of the presentation, we will focus on random binary search trees, which correspond to binary search trees generated using random uniform permutations. These models have been widely studied and an important result from Devroye gives the exact first-order asymptotic for their height. In the second part of the presentation, we will introduce a more general model of random permutations, called Mallows permutations, and study the properties of the height of binary search trees generated from these permutations.