ALPEN-ADRIA UNIVERSITÄT KLAGENFURT

INVITATION TO THE DOCTORAL SEMINAR

The distribution of the maximum protection number in random trees

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https://classroom.aau.at/math-stat

ABSTRACT

The *protection number of a vertex* v is the length of the shortest path from v to any leaf contained in the maximal subtree where v is the root. The study of protection numbers in trees began with the average number of vertices with protection number of at least 2 in ordered trees. This parameter was then studied in various other (specific) families of trees. Recent results in this direction have involved the average number of vertices with a protection number of at least k, studies on the protection number of the root of a tree, and the protection number of a randomly chosen vertex. An example of the application of protection numbers is in network security.

In this joint work with Clemens Heuberger and Stephan Wagner, we look at the parameter of the maximum protection number in simply generated trees — a family of rooted trees where for some weight generating function Φ with non-negative coefficients and $\Phi(0) = 1$, the generating function for the family of trees, $Y(x)$, can be expressed as $Y(x) = x\Phi(Y(x))$. Making use of generating functions, bootstrapping, and analytic techniques, we determine the distribution

for this parameter.

We hope to see you there!