

Speaker

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Title

Growing binary trees

Abstract

In this talk, we present a dynamic process for generating binary trees: at each step, active leaves called *anchors* either stop growing or are replaced by a subtree consisting of two new anchors attached to an internal node. We focus on *active trees* that retain at least one anchor and continue to grow. As these trees grow infinitely large, we demonstrate that the proportion of trees with a fixed number of anchors stabilizes toward a certain limit. We also show that the number of valid anchor configurations follows a meta-Fibonacci sequence, connect the model to Mandelbrot polynomials, and provide a uniform random generation algorithm for trees of a given profile. Finally, by incorporating tree height into our study, we reveal the geometric limit shapes and boundary forms of possible configurations as both the height and the number of nodes approach infinity.

This is joint work with Olivier Bodini and Antoine Genitrini.