Height of Pratt trees

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Abstract

The Pratt tree for a prime p is defined recursively as the tree with root node p, and below p are links to the prime factors q of $p-1$, below each q are links to the prime factors of $q-1$, and so on. It was used by Pratt in 1975 to show that every prime has a short certificate (proof) of primality. We investigate the distribution of the height $H(p)$ of the tree with root p, in particular illuminating the connection between $H(p)$, the distribution of primes in arithmetic progressions and branching random walks. In particular, based on an appropriate "random model" of the tree, we make a conjecture about the distribution of $H(p)$ which is perhaps surprising.
This is joint work with Sergei Konyagin and Florian Luca.

This talk should be accessible to graduate students.