

*A curious connection between branching processes and optimal stopping.*

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**ABSTRACT**

Topic based on joint work with David Assaf and Ester Samuel-Cahn.

A curious connection exists between the theory of branching processes and optimal stopping for independent random variables. In particular, for the branching process  $Z_n$  with offspring distribution  $Y$ , there exists a random variable  $X$  such that the probability  $P(Z_n = 0)$  of extinction of the  $n^{\text{th}}$  generation in the branching process equals the value obtained by optimally stopping the sequence,  $X_1, \dots, X_n$ , i.i.d distributed as  $X$ . The correspondence can be generalized to the inhomogeneous and infinite horizon cases, and furnishes sometimes simple 'stopping rule' methods for computing various characteristics of branching processes, including rates of convergence of the  $n^{\text{th}}$  generation's extinction probability to the eventual extinction probability. The curious connection can also be used in the other direction, to inform the theory of optimal stopping using results from branching.