Stochastic Fixed Point Equations

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Abstract

We will present an overview on solutions of Stochastic Fixed Point Equations,

$$X \stackrel{d}{=} \sum_n T_n X_n + C.$$

The random vector $(C, T_1, T_2, \ldots)$ is independent of the sequence $X_n, n \in \mathbb{N}$ of independent rvs with the same distribution as X.

The most well known solutions arise as limits in the context of Weighted Branching Processes, as the limit of the total weight in n-th generation correctly normalized. However there may be more. Prominent examples are the Quicksort, α-stable, and Weibull distributions.