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Combinatorial and Stochastic Properties of Ranked Tree-Child Networks

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Abstract

Ranking has recently been introduced for phylogenetic networks to make them more amendable to tools from combinatorics and probability theory. In particular, Bienvenu, Lambert and Steel have considered ranked tree-child networks and investigated properties of these networks. (Tree-Child Networks have become one of the most prominent classes of phylogenetic networks in recent years.) In this talk, we first review their results and then explain our own follow-up work which is concerned with bijective proofs of some of their results (answering two questions posed in their paper) and studying limit laws for the number of occurrences of pattern on the fringe of random ranked tree-child networks. The talk is based on joint work with Alessandra Caraceni (Scuola Normale Superiore, Pisa), Guan-Ru Yu (National Kaohsiung Normal University) and my postdoc Tsan-Cheng Yu and master student Hexuan Liu.