

國立中山大學應用數學系

學術演講

講者：Dr. Michael Wallner

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講題：From Computation to Combinatorics: Recursive Algorithms in Tree-Child Network Enumeration

時間：2026/03/26 (Thursday) 14:10 ~ 15:00

地點：理 SC4009-0 教室

茶會：13:30

Abstract

The Pons-Batle Conjecture proposes an identity between the cardinality of a specific class of words of length n and the set of tree-child networks with n nodes. Although the conjecture has been verified through computational methods, a definitive combinatorial explanation for this equivalence remains absent. This talk investigates the conjecture's underlying structural properties by establishing a correspondence between these networks and two distinct families of lattice paths. To facilitate a comprehensive understanding, this presentation will provide a foundational introduction to generating functions and define all necessary concepts from first principles. By encoding the lattice path framework into generating functions and employing a recursive algorithm based on the count of reticulation nodes, we provide an alternative proof for all families with up to 250 reticulations. While a direct bijection is still an open challenge, this lattice path perspective offers a significant advancement toward a purely combinatorial understanding of tree-child structures.

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