

# Non-contiguous pattern avoidance in binary trees

**Lara K. Pudwell** (Valparaiso University)

In 2010, Rowland considered pattern avoidance in rooted ordered binary trees with the following definition: binary tree  $T$  contains binary tree  $t$  if and only if  $T$  contains  $t$  as a contiguous rooted ordered subgraph. In this talk, we modify Rowland's definition such that binary tree  $T$  contains tree  $t$  if and only if there is a sequence of edge contractions of  $T$  that produce tree  $T^*$  which contains  $t$  as a rooted ordered subgraph. While Rowland's tree patterns are analogous to consecutive permutation patterns, this new definition is analogous to classical permutation patterns. We completely classify Wilf-classes of trees avoiding a single non-contiguous binary tree pattern and provide generating functions that enumerate pattern-avoiding trees according to number of leaves. We also consider trees that avoid multiple tree patterns simultaneously and provide bijective relationships between certain sets of pattern-avoiding trees and sets of pattern-avoiding permutations.

This is joint work with Mike Dairko, Samantha Tyner, and Casey Wynn.