

# *Structure of 4-Leaf Powers*

**R. Sritharan**

*Computer Science Department  
University of Dayton*

Graph  $G$  is a  $k$ -leaf power of tree  $T$  if vertices of  $G$  can be mapped (by a bijection) to leaves of  $T$  in such a way that two vertices in  $G$  are adjacent if and only if the distance in  $T$  between the corresponding leaves is at most  $k$ . In this case,  $T$  is called a  $k$ -leaf root of  $G$ . We give a structural description of 4-leaf powers. Our structural results aid in our design of a linear time algorithm to test if a given arbitrary graph is a 4-leaf power; this improves the previous best bound of  $O(n^3)$  for the problem. Currently, the problems of characterizing and recognizing  $k$ -leaf powers, when  $k \geq 6$ , are open. This is joint work with Andreas Brandstädt and Van Bang Le of University of Rostock, Germany.