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Advances in Applied Mathematics

Volume 7, Issue 3, September 1986, Pages 309-343

Reconstructing the shape of a tree from observed dissimilarity data \hat{d}

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Abstract

Branching structures, alias topological tree structures are fundamental to any hierarchical classification that aims to relate objects according to their similarities or dissimilarities. This paper provides a rigorous treatment of these structures, and continues previous work of Colonius and Schulze on H -structures. Thus extensive use is made of the so-called neighbors relation associated with a dissimilarity index. Arbitrary dissimilarity data are then analyzed by comparing their neighbors relations with ideal, that is, tree-like relations: if it matches an ideal relation, then one can readily construct a tree representing the data that is optimal in a certain sense. Finally, some algorithms are proposed for fitting observed data to tree-like data.



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Partly supported by the Stiftung Volkswagenwerk.

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