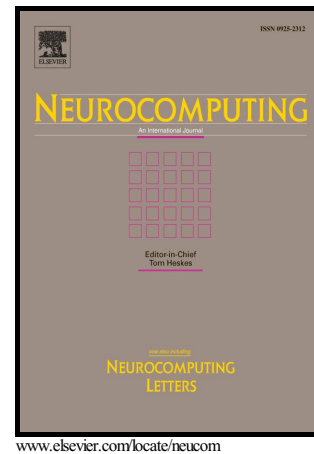


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Learning Discriminative Tree Edit Similarities for Linear Classification - Application to Melody Recognition

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Abstract

Similarity functions are a fundamental component of many learning algorithms. When dealing with string or tree-structured data, measures based on the edit distance are widely used, and there exist a few methods for learning them from data. In this context, we recently proposed GESL (Bellet et al., 2012), an approach to **string edit similarity** learning based on loss minimization which offers theoretical guarantees as to the generalization ability and discriminative power of the learned similarities. In this paper, we argue that GESL, which has been originally dedicated to deal with strings, can be extended to **trees** and lead to powerful and competitive similarities. We illustrate this claim on a music recognition task, namely melody classification, where each piece is represented as a tree modeling its structure as well as rhythm and pitch information. The results show that GESL outperforms standard as well as probabilistically-learned edit distances, and that it is able to describe consistently the underlying melodic similarity model.

Keywords: edit distance, convex optimization, tree-structured data, melody recognition

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