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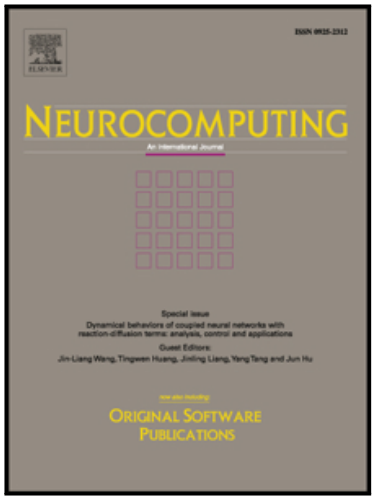

Dynamic Multiscale Tree Learning Using Ensemble Strong Classifiers for Multi-label Segmentation of Medical Images with Lesions

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Dynamic Multiscale Tree Learning Using Ensemble Strong Classifiers for Multi-label Segmentation of Medical Images with Lesions

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Abstract

We introduce a dynamic multiscale tree (DMT) architecture that learns how to leverage the strengths of different state-of-the-art classifiers for supervised multi-label image segmentation. Unlike previous works that simply aggregate or cascade classifiers for addressing image segmentation and labeling tasks, we propose to embed strong classifiers into a tree structure that allows bi-directional flow of information between its classifier nodes to gradually improve their performances. Our DMT is a generic classification model that inherently embeds different cascades of classifiers while enhancing learning transfer between them to boost up their classification accuracies. Specifically, each node in our DMT can nest a Structured Random Forest (SRF) classifier or a Bayesian Network (BN) classifier. The proposed SRF-BN DMT architecture has several appealing properties. First, while SRF operates at a patch-level (regular image region), BN operates at the super-pixel level (irregular image region), thereby enabling the

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