



Feature Descriptors For Nodule Type Classification

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Abstract:

This paper examines feature-based nodule description for the purpose of nodule categorization (i.e., associating detected nodules into types) in low-dose CT scanning (LDCT). The multi-resolution Local Binary Pattern (LBP) and Distance Transform of the edge maps were used to generate the features that describe the texture and shape of common nodules and non-nodules. The LBP of the Distance Transform output were merged together to obtain shape and texture based feature descriptors of the nodules and non-nodules. These features were optimized using PCA and LDA, and the resultant sets were used for classifying/categorization into five categories: juxta-pleural, vascularized, pleural-tail, well-circumscribed and non-nodule. In the categorization process, the combinational shape and texture based feature descriptor resulted in an overall 12% enhancement in results when compared to using shape and texture features separately. These results are encouraging and good indicators for progress towards fully automated detection, segmentation, categorization (into types) and classification (into pathologies) of lung nodules from LDCT scans.

Keywords:

lung nodule classification, Distance Transform, Geometric Descriptors

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