Quantitative CT Analysis of Pulmonary Nodules for Lung Adenocarcinoma Risk Classification Based on an Exponential Weighted Grey Scale Angular Density Distribution Feature

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PII: S0169-2607(17)30700-9
DOI: 10.1016/j.cmpb.2018.04.001
Reference: COMM 4668

To appear in: *Computer Methods and Programs in Biomedicine*

Received date: 5 June 2017
Revised date: 21 February 2018
Accepted date: 2 April 2018

Please cite this article as: Vanbang Le , Dawei Yang , Yu Zhu , Bingbing Zheng , Chunxue Bai , Hongcheng Shi , Jie Hu , Changwen Zhai , Shaohua Lu , Quantitative CT Analysis of Pulmonary Nodules for Lung Adenocarcinoma Risk Classification Based on an Exponential Weighted Grey Scale Angular Density Distribution Feature, *Computer Methods and Programs in Biomedicine* (2018), doi: 10.1016/j.cmpb.2018.04.001

Highlight

- A greatly robustness and highly effective pulmonary nodule classification system.
- The reference map is constructed using an integral image and labelled the map by K-means. Then, the grey density distribution feature is generated.
- Furthermore, we proposed the feature extraction method for pulmonary nodule image by designing an exponential weighted multi-angular histogram to describe each component of the grey density distribution features.
- The proposed feature combined with Random Forest model to classify lung nodule to four categories: Atypical Adenomatous Hyperplasia (AAH), Adenocarcinoma In Situ (AIS), Minimally Invasive Adenocarcinoma (MIA), and Invasive Adenocarcinoma (IA).