LOLA11: Multi-Resolution Convolutional Neural Networks for Lung, Fissure, and Lobar Segmentation in Computed Tomography

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Abstract

Multi-scale convolutional neural networks are applied to segment lungs, fissures, and lobes in pulmonary computed tomography (CT) images. The method is an extension of the fissure detection method proposed in "FissureNet: A Deep Learning Approach for Pulmonary Fissure Detection in CT Images" [1]. The algorithm proposed in [1] only enhances fissures; it assumes a lung segmentation is available and does not provide final lobar segmentations. The FissureNet method was extended to a fully automated pipeline for segmentation of lungs, fissures, and lobes. For the lung and lobe segmentation portions of the pipeline see [2] and [3], respectively. After publication of the full pipeline algorithm, a full description will be uploaded.

References

[1] Gerard, S.E., Patton, T.J., Christensen, G.E., Bayouth, J.E., Reinhardt, J.M.: FissureNet: A deep learning approach for pulmonary fissure detection in CT images. IEEE Trans. Medical Imaging **38**(1) (2019) 156–166 PMID: 30106711.

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[3] Gerard, S.E., Reinhardt, J.M.: Pulmonary lobe segmentation using a sequence of convolutional neural networks for marginal learning. In: 2019 IEEE 16th International Symposium on Biomedical Imaging (ISBI 2019). (2019) 1207–1211