Call for Papers
IEEE Transactions on Medical Imaging Special Issue on Annotation-Efficient Deep Learning for Medical Imaging

Description

Deep learning methods have transformed markedly over the past few years, and so has our approach to medical image analysis. However, the challenge remains that deep learning models are data-hungry in nature, more so than ever requiring large, high-quality annotated datasets. Yet, rarely does one have a perfectly-sized and carefully-labeled dataset with which to train a deep learning model, particularly in medical imaging where data and annotations are expensive to acquire. This problem becomes more pronounced for rare conditions or when scaling up to multiple conditions where it becomes impractical to collect large quantities of annotated data. Consequently, there is a need for innovative methodologies that enable annotation-efficient deep learning for medical imaging.

Topics of Interest

The problem of deep learning with limited annotations has recently attracted the attention of the medical imaging community. However, the literature in this area is dispersed. Publications are scattered under various topics and there are numerous gaps. The time is right to address this challenge with a holistic approach towards annotation-efficient deep learning for medical imaging, covering, but not limited to, the following topics:

- How to acquire annotation efficiently
  - Smart selection of patients/samples for annotation
  - Efficient tools for fast acquisition of annotations
- How to learn with a limited quantity of annotation
  - Learning to predict never-seen diseases
  - Learning to diagnose rare diseases from only a few annotations
- How to utilize (existing) annotation efficiently
  - Effective utilization of high-level weak annotation
  - Handling of noise and errors in (existing) annotation
  - Integration of multiple sources of related annotation
- How to leverage unannotated data
  - Learning generic knowledge from unannotated data
  - Training models with both annotated and unannotated data
  - Training models with pseudo-labeled data

Submission Process

Authors must submit manuscripts digitally according to the instructions provided here, stating in their cover letter that the submission is for this special issue. To determine the suitability of research for this special issue, authors are encouraged to contact the Guest Editors or refer to this survey article for guidance.

Important Dates

Paper submission deadline:	July 1, 2020
First reviews due:	September 1, 2020
Revised manuscript due:	November 1, 2020
Final decision:	December 1, 2020
Camera ready version:	December 15, 2020

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