

学术报告会

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“Deep Learning in Medical Image Analysis”

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Abstract:

This talk will summarize our recent work on using deep learning for medical image analysis. Deep learning is an unsupervised method that can discover new features suitable for different applications. Although the conventional human-made filters can be used to extract certain advanced features, it is time-consuming to discover a new filter and also the extracted features may not fit a particular study under consideration. Besides, a lot of efforts need to spend on the testing and selection of different choices of human-made features, which is difficult for the researchers with limited experience to select suitable features. On the other hand, deep learning is designed to automatically discover features, from a set of given data, for each particular application. Therefore, it is able to discover new features that were never discovered by researchers before. In the past year, we started to apply deep learning for various applications in medical image analysis area, e.g., image segmentation, registration, and disease classification, all of which can be formulated as feature-matching problems and thus can be solved effectively with the learned new features by deep learning. In this talk, I will demonstrate the applications of deep learning in segmenting hippocampus, registering brain images, and identifying brain disorders from multi-modality data (in the field of neuroimaging). I will also show the results on segmenting prostate from MR images, which is important for in vivo diagnosis of prostate cancer and also the radiotherapy of prostate cancer.

Biography:

Dinggang Shen is a Professor of Radiology, Biomedical Research Imaging Center (BRIC), Computer Science, and Biomedical Engineering in the University of North Carolina at Chapel Hill (UNC-CH). He is currently directing the Image Display, Enhancement, and Analysis (IDEA) Lab in the Department of Radiology, and also the medical image analysis core in the BRIC. Before joining UNC-CH, he was a tenure-track assistant professor in the University of Pennsylvania (UPenn), and a faculty member in the Johns Hopkins University. Dr. Shen's research interests include medical image analysis, computer vision, and pattern recognition. He has published more than 290 papers in the international journals and conference proceedings. He serves as an editorial board member for five international journals.