UNIVERSITY of WISCONSIN
UWMILWAUKEE

Special Interest Group
on Big Data

Weekly Seminar

12pm - 1pm, Friday, November 1, 2019
UWM EMS E237
(food/drink will be provided)

Breast Cancer Tumor Classification using Deep Convolutional Neural Networks and Transfer Learning

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Abstract:

Breast cancer is the most common type of cancer among women and the second most common cause of cancer death in women. The early diagnosis of breast cancer can improve the prognosis and chance of survival significantly, as it can promote timely clinical treatment to patients. Mammography is the most useful approach for diagnosing breast cancer, but prone to human errors. Computer-aided detection and diagnosis (CAD) systems have a vital role in helping the radiologists and physicians for better detection of breast cancer and deciding about the treatment process. Within recent years, several machine learning and deep learning-based methods have been proposed for mammogram analysis tasks such as segmentation and classification. Specifically, researchers used deep convolutional neural networks along with the transfer Learning method for breast cancer tumor classification. Transfer learning solves the problem of having a limited number of images in some areas that do not access to a huge dataset like medical fields.

In this talk, I will be discussing my recent study on breast cancer tumor classification using deep convolutional neural networks (DCNN) and transfer learning. In this research, we used different DCNNs along with transfer learning technique to classify breast cancer tumors in mammograms into benign and malignant classes. Trying different deep architectures, we found that Inceptionv3 is superior and generates the most accurate results. Different batch sizes and learning rates were studied for model training. Besides, we used Inceptionv3 architecture for 3-class and 5-class breast cancer tumor classification. The results prove the strength of this network for multi-class classification task. We used accuracy, AUC, recall, precision, and F1-Score metrics to evaluate the performance of the networks.