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"AI of medical imaging: aspects in repeatability, robustness, and analysis at scale"

Abstract:

Computer-aided diagnosis (CAD) uses artificial intelligence and machine learning (AI/ML) methods to analyze medical images at scale and provide clinical decision-making support. Evaluating the repeatability and robustness of CAD across the AI/ML pipeline is essential for clinical translation. In this talk, I will discuss recent projects in advancing methods to evaluate repeatability of CAD for breast cancer using dynamic contrast-enhanced magnetic resonance imaging. These methods were developed to provide additional evaluation of the impact of training set variability to lesion-based classification. I will also discuss our work in evaluating the robustness of CAD and AI/ML workflows for breast cancer across international datasets, including harmonization of both radiomic features and feature selection and evaluation of its impact on lesion classification.

BIO:
Heather M. Whitney, PhD is a research assistant professor in the Department of Radiology at the University of Chicago. Dr. Whitney received a Master of Science in Medical Physics from the Vanderbilt University School of Medicine and Master of Science and PhD in Physics from Vanderbilt University. While at Vanderbilt, she trained and conducted research at the Vanderbilt University Institute of Imaging Science and additionally collaborated with faculty in the Department of Radiation Oncology.

At the University of Chicago, she conducts research in computer-aided diagnosis of breast and ovarian cancer, focusing on the modalities of dynamic contrast-enhanced magnetic resonance imaging and ultrasound. Her primary areas of interest are in artificial intelligence and radiomics across the imaging and classification pipeline, from image acquisition to performance evaluation and data harmonization. She also conducts research and collaborates in MIDRC, the Medical Imaging and Data Resource Center. Within MIDRC she works on methods of task-based distributions, interoperability between data enclaves, and monitoring and studying the diversity and representativeness of the MIDRC data commons to foster research in AI and health disparities.