

DISTINGUISHED LECTURER SERIES

Biomarker Detection, Brain Response Characterization and Outcome Prediction for ASD

James S. Duncan, PHD

Ebenezer K. Hunt Professor of Biomedical Engineering, Electrical Engineering & Radiology and Biomedical Imaging



BYAC 110

Friday, February 7

11:00 AM

ABSTRACT:

Functional magnetic resonance imaging (fMRI) has been shown to be helpful for the study of autism spectrum disorders (ASD). This talk will describe the evolution of efforts in this area that carry promise for producing objective biomarkers for ASD from both resting-state and task-based fMRI, as well as predicting patient response to a behavioral therapy known as Pivotal Response Treatment (PRT) from baseline task-based fMRI. Such biomarkers would provide an important step in better understanding the underlying pathophysiology of ASD. Patient response prediction could help with objective and personalized diagnosis, provide new targets for development of new treatments, and provide a way to monitor patient progress. First, early image analysis efforts will be described that were based on estimating connected subnetwork membership using multi-view (structural and functional) MRI data. Next, more recent work based on data-driven (deep) learning will be presented that has focused on deriving ASD biomarkers from both resting-state and task-based functional connectivity measures. Finally, two approaches will be presented that predict patient response to PRT behavioral therapy, guided by the above-mentioned biomarkers.

BIOGRAPHY:

James S. Duncan is the Ebenezer K. Hunt Professor of Biomedical Engineering and a Professor of Radiology & Biomedical Engineering, Electrical Engineering and Statistics & Data Science at Yale University. Dr. Duncan received his B.S.E.E. with honors from Lafayette College, and his M.S. and Ph.D. from the University of California, Los Angeles. Dr. Duncan's research efforts have been in the areas of computer vision, image processing, and medical imaging, with an emphasis on biomedical image analysis and image-based machine learning. He has published over 260 peer-reviewed articles and has been the principal investigator on grants from NIH and NSF. He is a Life Fellow of IEEE, and a Fellow of the American Institute for Medical and Biological Engineering and of the Medical Image Computing and Computer Assisted Intervention Society. He has served as co-Editor-in-Chief of Medical Image Analysis, as an Associate Editor of IEEE Transactions on Medical Imaging, and on the editorial boards of Pattern Analysis and Applications, the Journal of Mathematical Imaging and Vision, and the Proceedings of the IEEE.

CIDSE HOSTS: Teresa Wu, Yalin Wang and Jing Li

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