Big Data Training for Cancer Research

Special Lecture Series

Machine Learning in Diagnostic Imaging - Methodologic Considerations

Dr. Constantine Gatsonis

June 16, 2020, 1:00 – 2:30 PM (EST)

Abstract:

The quantitative analysis of imaging via machine learning methods ("radiomics") is defining the new frontier for diagnostic imaging research and radiology practice. Discovery research in radiomics is generating a broad array of imaging-based markers for diagnosis and prediction. A majority of these markers are based on deep learning with convolutional neural networks.
Clearly the potential of radiomic markers is great. However, the clinical evaluation of the new markers poses important challenges for researchers and regulators. Developmental pathways for radiomic markers to reach the maturity and standardization necessary for clinical evaluation are not yet well established. The markers evolve rapidly and typically include a formal learning component. Moreover, the quantification of uncertainty, interpretability, and face validity of marker results are matters of current research. In this presentation we will provide an overview of radiomics from the statistical perspective, drawing examples from recently published and ongoing radiomics research. We will also examine the challenges posed by the clinical evaluation of the new markers.

Series Schedule:

June 8: Dr. Timothy Ratliff – Purdue University
June 9: Dr. Peter Kraft – Harvard University
June 12: Dr. Sean Davis – The National Cancer Institute
June 15: Dr. Daniel Raftery – University of Washington
June 16: Dr. Constantine Gatsonis – Brown University
June 18: Dr. Mark Kelley – Indiana University
June 19: Dr. Warren Kibbe – Duke University
Register for other lectures: www.purdue.edu/bigcare

Speaker Bio:

Constantine Gatsonis is Henry Ledyard Goddard University Professor, and founding Chair of the Department of Biostatistics and the Center for Statistical Sciences at the Brown University School of Public Health.

Dr. Gatsonis is a leading authority on the evaluation of diagnostic and screening tests and has made major contributions to statistical methods for medical technology assessment and health services and outcomes research. His current research activity spans the spectrum of evidence-based diagnostic medicine, addresses both methodology and subject matter, with foci on radiomics and the comparative effectiveness of screening and diagnostic modalities. As the founding Network Statistician of the American College of Radiology Imaging Network (ACRIN) and a Group Statistician for the ECOG-ACRIN collaborative group he has decades long experience in the clinical evaluation of modalities for screening, diagnosis and prediction in cancer and other chronic diseases. Dr. Gatsonis is a statistical consultant for the New England Journal of Medicine. He chaired the NAS Committee on Applied and Theoretical Statistics, was a member of the NAS Committee on National Statistics and recently served on the NAS Committee on Reproducibility and Replicability in Science. Dr. Gatsonis was educated at Princeton and Cornell, was elected fellow of the American Statistical Association and received a Long-Term Excellence Award from the Health Policy Statistics Section of ASA.

Register at: https://us02web.zoom.us/webinar/register/WN_7KpLyFdrRam1FIrbWLP_wg