Stony Brook University

Biomedical Informatics Grand Rounds

Prateek Prasanna, Ph.D.;

Postdoctoral Research Associate, Case School of Medicine & Department of Biomedical Engineering, Case Western Reserve University

Research Assistant Professor, Department of Biomedical Informatics, Stony Brook University

Radiomics and Radiogenomics for Precision Oncology: Current Trends and Open Challenges

Wednesday, October 16, 2019 3 pm—4 pm
Health Science Center L2-3B

Abstract:

With the advent of newer and faster imaging techniques, the specificity of cancer diagnosis has improved considerably. However, even though existing tools and modalities provide important information regarding cancer phenotypes, the details are not holistic in many circumstances. Most malignant tumors have heterogeneous growth, leading to disorderly proliferation well beyond the surgical margins. Not all imaging characteristics are perceptible to the human eye, often leading to diagnostic dilemma. There is, hence, a need for identifying non-invasive markers that can reliably distinguish similar appearing pathologies on routine imaging for early diagnosis as well as treatment evaluation. In this talk, Dr. Prasanna will focus on his recent efforts in developing radiomic (extracting computerized sub-visual features from radiologic imaging) and radiogenomic (identifying radiologic features associated with molecular phenotypes) techniques to capture insights into the underlying tumor biology as observed on routine clinical imaging. He will discuss clinical applications of his work in predicting disease outcome, recurrence, and response to therapy specifically in the context of brain, breast, and lung cancers. This will include current efforts in developing new domain-inspired radiomic features for post-treatment evaluation and predicting response to radiation and immunotherapy treatment. Such features, comprising textural, deformation, and vascular tortuosity attributes, deliver a radiographic proof and appreciation of the systemic nature of cancer.

Bio:

Prateek Prasanna received his PhD in Biomedical Engineering from Case Western Reserve University (CWRU) in 2017. Prior to that, he obtained his Masters degree in Electrical and Computer Engineering from Rutgers University in 2013. He is currently a Research Associate at the Case School of Medicine and the Department of Biomedical Engineering, CWRU, and a Research Assistant Professor in the Department of Biomedical Informatics, Stony Brook University. He has authored over 30 peer-reviewed publications in leading international journals and conferences in the areas of medical image analysis. Dr. Prasanna's research focuses on building clinically translatable machine learning tools that leverage multiple data streams of imaging, pathology and -omics for enabling better treatment decisions and evaluating response to different therapies. In his doctoral and postdoctoral career, his research has involved developing companion diagnostic tools for thoracic-, neuro-, and breast-imaging applications. He has been instrumental in developing NeuroRadVision – a CAD tool to distinguish recurrent brain tumors from radiation induced treatment effects using multi-parametric MRI. More recently, he has been working on integrating imaging features with histopathological and genomic attributes of non-small cell lung cancer, to predict response to immunotherapy. His research on neuro- and breast-imaging has won several innovation awards and received recognition from the Ohio Secretary of State and House of Representatives, besides featuring in various media outlets, including Crain's Cleveland Business and NSF Science Now.

CME Credit Available

Questions? Please call the Biomedical Informatics Department at 631-638-2590.