



Biomedical Informatics Grand Rounds



Anupama Reddy, PhD;

Founder & CEO, Prism Bioanalytics LLC

Precision Medicine through the Lens of Machine Learning: Why one model does not fit all data?

Wednesday, February 12, 2020 3 pm—4 pm
Health Science Center L3-LH6

Abstract:

High throughput technologies, like next generation sequencing, have transformed biomedical research into a data-driven field. We are increasingly reliant on statistics and machine learning to discover disease-associated variants/genes/pathways and to translate them into drug targets or biomarkers for clinical use. Additionally, there is an increase in the number of well-powered studies, e.g. TCGA, making it possible to reliably use complex machine learning models that can learn the interplay between the features and outcome.

There is a plethora of different transformation methods, data representations, and machine learning models to choose from when analyzing a dataset. This raises the question of how do we navigate through these choices, and if there is a single method that outperforms the others. In this talk, I will present multiple vignettes from my work, showing how the choice of methods can be informed by the structure of the data, the question being asked, prior knowledge, and how we plan to use the model. These case studies include predicting drug sensitivity from cell lines, survival modeling to predict risk scores, and others. I will also discuss an ongoing project to characterize drug combinations with similar mechanisms of action using deep learning/convolutional neural networks.

We are also building a machine learning platform PrismML that enables users to interactively query a dataset and run a multitude of machine learning tools from simple statistical tests to multivariate modeling. Since machine learning models are computationally intensive, we have used the power of cloud computing to make the analyses faster and scalable. The main goal of this project is to accelerate discovery by bringing the power of machine learning to the genomics community, especially to bench scientists and physicians.

Bio:

Dr. Anupama Reddy is the Founder and CEO of Prism Bioanalytics, a bioinformatics consulting company, providing computational support to clients in academia, hospitals and the pharma industry. Dr. Reddy has 15 years of experience as a bioinformatics scientist, with deep expertise in machine learning, genomics, statistics, and drug discovery. Dr. Reddy worked at Duke University as a group leader for 5 years, and at Novartis Institutes of Biomedical Research as an Investigator also for 5 years. She has a Ph.D. from Rutgers University.

****CME Credit Available****

Continuing Medical Education Credits: The School of Medicine, State University of New York at Stony Brook, is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians. The School of Medicine, State University of New York at Stony Brook designates this live activity for a maximum of 1.00 AMA PRA Category 1 Credit(s)[™]. Physicians should only claim the credit commensurate with the extent of their participation in the activity.

Disclosure Policy: All those in control of CME content are expected to disclose any relevant financial relationship with a commercial interest (defined as any entity producing, marketing, reselling, or distributing health care goods or services consumed by, or used on, patients) that relates to the content that will be discussed in the educational presentation. All commercial relationships that create a conflict with the planners, speakers, authors' control of content must be resolved before the educational activity occurs.

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