Stony Brook University

Biomedical Informatics Special Seminar

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Big Data Analytics in Healthcare: From Vector to Tensor

Tuesday, Apr 2, 2019 10 am—11 am

Seminar Room HSC-L2 Room 3B

Abstract:

In the last decade, rapid advances in medicine and technology have resulted in explosive growth in medical data. More and more data are being captured around healthcare processes in many ways from many sources, such as Electronic Health Records (EHR), health insurance claims, medical imaging databases, disease registries, spontaneous reporting sites, and clinical trials. As a result, integration and analysis of large amounts of heterogeneous medical data have become critical to the healthcare world. Meanwhile, huge amounts of medical data from too many sources make the task of data analytics very cumbersome. So it is imperative to design effective algorithms and develop efficient frameworks for medical data analytics.

In this talk, I will present two projects on how we use tensor and graph analysis methods to model and learn heterogeneous medical data. The first project addresses the challenge of integrating multiple data sources in the context of tensor algebra. In particular, I will describe a method to merge all data sources into a high-order tensor that we can easily navigate to machine learning. The second project addresses the challenge of analyzing complex data types in the context of graph theory. I will introduce a method to model data as graphs and leverage the strength of deep learning to extract features from multiple sources for accurate predictions. I'll also introduce future work in this direction and explain some possibilities for upcoming evolutions in big-data research in healthcare.

Bio:

Dr. Lifang He is currently a postdoctoral researcher in the Department of Biostatistics at the University of Pennsylvania (UPenn). She received her PhD in Computer Science from South China University of Technology in 2014. Before joining UPenn, she worked as a postdoctoral researcher in Computer Science at University of Illinois at Chicago, and Weill Cornell Medical College of Cornell University. Her research interests are in machine learning, data mining, and biomedical informatics, with emphasis on addressing the data variety issues in medical and social sciences. She has published more than 50 papers in peer-reviewed conferences and journals, including NIPS, ICML, CVPR, KDD, WWW, AAAI, ICDM, SDM, WSDM, AMIA, and TIP.

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