Stony Brook University

Biomedical Informatics Grand Rounds

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Part I: Giving the Power Back to Physicians – Geometry and Control in Biomedical Informatics

Wed, April 25 2018 3pm—4pm

Atkins Center – HSC Level 4 (Radiology)

Abstract: This talk is designed to be part one of a two-part seminar series for which we lay several foundational constructs of varying algorithmic approaches in biomedical informatics. Here, we will present basic theory and recent advances in discrete geometry and control theory as applied to network science and computational imaging. To motivate necessary mathematical ingredients, we begin by revisiting classical vision problems in segmentation, shape analysis, shape registration, and pose estimation. Concepts such as curvature and its connection to not only system robustness, but also in shape reconstruction will be introduced. From this, we then shift our attention towards how such concepts can be applied in networks to elucidate functional properties of complex systems. Lastly, we will highlight applications in biomedical informatics and set the foundation for the second part of this seminar which will focus on interactive control and incorporation of expert (physician knowledge) in a proper framework from which a host of useable clinical tools maybe deployed.

This talk is designed for a graduate level audience interested recent approaches in information geometry as applied to biomedical informatics.

Bio: Romeil Sandhu is currently an Assistant Professor at Stony Brook with appointments in Bioinformatics, Computer Science, and Applied Mathematics & Statistics Departments and is the recipient of the AFOSR YIP Award for work on interactive feedback control for autonomous systems and NSF CAREER Award for work on geometric optimization and control of time-varying networks. He first received his B.S. and M.S. degrees from the Georgia Institute of Technology in Electrical Engineering in 2006 and 2009, respectively. Then, he completed his Ph.D. in 2011. Prior to his academic position at Stony Brook, he formed a data science startup providing government services leading to a successful exit. His current research interest broadly focuses on formally developing theory to bridge the information gap to combat risk complexities associated with the "unknown unknown" (e.g., human interaction). This has included application areas that span complex networks, computer vision, learning, social analysis, biomedical informatics, and risk analysis with a common underlying interest lying on the intersection of geometry, statistics, and control.

****CME CREDIT AVAILABLE****

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