BUET ACM CHAPTER

presents

Functional Interpretation of Omics Data for Health and Disease

Speaker: **Sumaiya Nazeen**

Postdoctoral Research Fellow, Harvard Medical School, Brigham and Women's Hospital
Boston, MA

Sumaiya Nazeen, Ph.D., is a postdoctoral research fellow with a joint appointment between Sunyaev and Khurana labs at the Brigham and Women's Hospital, Harvard Medical School. Her research focuses on the development of computational and statistical models to interpret the genetic foundation of complex human diseases. Her current projects include network-based rare variant analysis, patient stratification, and biomarker discovery for rare diseases, especially Lewy body pathologies. Sumaiya pursued her Bachelor's degree from the Department of CSE at BUET and graduated receiving both the Chancellor's Award and Prime Minister's gold medal. She obtained her S.M. and Ph.D. in Computer Science at MIT under the supervision of Prof. Bonnie Berger. Prior to going to MIT, she served as a lecturer at the Department of CSE, BUET.

Abstract

Recent advances in next-generation sequencing technologies have resulted in an explosive growth of diverse omics data. Functional interpretation of such data faces challenges due to their size, multi-modality, and heterogeneity. Surmounting these challenges requires intelligent algorithms and scalable analytical frameworks. In this talk, I will present new computational methods that address these challenges to discover novel biological insights in downstream analyses. First, I will describe our sensitive and scalable alignment-free metagenomic functional profiling tool, Carnelian, that generates accurate and comparable functional summaries of large-scale metagenomic datasets. I will demonstrate how we can uniquely reveal trends in microbial metabolic function across diverse populations (different nations or geographical boundaries) concerning healthy and disease individuals using these summaries. Second, I will describe our statistical framework for assessing the rare variant burden in pathways of interest and its application in rare diseases.

When: Saturday, 22nd August, 2020 (8:00 PM)

Where: Online. Zoom Meeting ID: 619 0442 1587, Password: 782106

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