

Postgraduate Seminar Series

Venue: Graduate Seminar Room

Date & Time: July 06, 2024 at 3:00 PM

Speaker Information

Sheikh Saifur Rahman Jony (Student No. 0423052039) is a full-time M.Sc. student in the Department of Computer Science and Engineering (CSE) at the Bangladesh University of Engineering and Technology (BUET). He earned his undergraduate degree from BUET in 2023. His research interests encompass Computational and Systems Biology and Artificial Intelligence. He is currently pursuing his postgraduate thesis under the guidance of Prof. M. Sohel Rahman. In this talk, he will discuss his ongoing research.



EXPLAINABLE MACHINE LEARNING BASED MODELING OF CELLULAR DYNAMICS

Delineating the mechanisms underlying cell state changes is key to gaining insights into organismal development and disease prognosis. Various methods have been proposed to study cellular differentiation and cell fate specification. However, they either do not incorporate temporal information or do not consider the vital role of intercellular communication in cellular differentiation and cell fate determination. Furthermore, many of these methods lack interpretability, making it difficult to identify the critical genes and pathways that influence the differentiation process. We developed **CC-Tempo**, a cell-cell communication-aware model of cellular dynamics that leverages intercellular communication scores and can help identify important genes and pathways crucial for different stages of differentiation in various lineages. While previous studies have indicated that scRNA-seq data alone may not suffice for accurately predicting cell fates, CC-Tempo demonstrates that incorporating intercellular communication significantly enhances the performance of such models. CC-Tempo can predict the significance of genes and pathways at different stages of the differentiation process. By perturbing these genes in silico, CC-Tempo reveals their efficacy for manipulating cell fate, which can be crucial for defining efficient reprogramming factors.