DEPARTMENT OF COMPUTER SCIENCE

SEMINAR

2024 SERIES

Robust Learning with Evolving Data Streams for Personalized Healthcare

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ONLINE VIA ZOOM

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ABSTRACT

The proliferation of data acquisition technologies such as wearable devices, sensors, data logging, imaging, and IoT, has produced vast amounts of data across domains. This influx of data has empowered AI applications in scientific domains and for social good. In healthcare, for instance, AI has unleashed the potential of data such as Electronic Health Records (EHRs) for predicting disease progression, medical time series for recognising patient activities, medical images for diagnosing lesions, and medical articles for creating clinical QA chatbots. However, with the increasing deployment of AI systems in complex and changing environments where the data may be imperfect and constantly evolving, the challenge has shifted from model development to model deployment, raising concerns about the reliability of these systems.

In this talk, with healthcare as the area of focus, I will begin by examining the major limitations of health data that impede the deployment of machine learning models in dynamic open-world scenarios. Then I will introduce a model personalisation framework for evolving data streams, which aligns with the principles of personalisation in precision medicine, aiming to address the challenges of generalisation caused by limited health data. Within the framework, I will present our series of works that provide insights on key research problems: 1) robust learning on irregular time series that are integrated from heterogeneous sources; 2) learning adaptable representations in the face of shifting label domains; and 3) detecting out-of-distribution tasks from task streams in meta-learning scenarios. Finally, I will conclude the talk by outlining potential future research directions.

SPEAKER'S BIOGRAPHY

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