

DEPARTMENT OF COMPUTER SCIENCE

SEMINAR

2024 SERIES

Bayesian Tensor Learning for High-Order Dynamic Data

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ONLINE VIA ZOOM



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ABSTRACT

Despite the remarkable success AI has achieved via deep learning (DL) in the past decade, particularly in vision and language tasks, there remain more challenging real-world tasks involving noisy, sparse, and high-order data that do not fit well within the current DL models. Tensor Learning under Bayesian framework stands as a pivotal tool for analysing such structural data. However, classical methods exhibit significant limitations when processing dynamic data, such as streaming tensor or tensor with temporal patterns. This presentation will showcase a series of works in Bayesian Tensor Learning for dynamic data, focusing on two key aspects: Streaming Tensor Analysis and Temporal Tensor Modeling. The first part of the study introduces methods tailored for streaming data, facilitating efficient online learning and incremental model updates. This approach offers computational efficiency for large-scale, real-time datasets. The second part explores modelling the temporal features inherent in tensor, enabling the low-rank dynamic representation of time-variant structural data. With the proper design of the model, we can post linear-cost online inference for tensor-valued time series.



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