Preface

Tensor decomposition and tensor networks (TNs) are factorizations of high order tensors into a network of low-order tensors, which have been studied in quantum physics, chemistry and applied mathematics. In recent years, TNs have been increasingly investigated and applied to machine learning and AI fields, due to its significant efficacy in modeling large-scale and high-order data, representing model parameters in deep neural networks, and accelerating computations for learning algorithms. In particular, TNs have been exploited to solve several challenging problems in data completion, model compression, multimodal fusion, multitask knowledge sharing and theoretical analysis of deep neural networks. More potential technologies using TNs are rapidly emerging and finding many interesting applications in machine learning, such as modeling probability functions, probabilistic graphical models and implementing efficient TN computations in GPU. However, the topic of TNs in machine learning is relatively young and many open problems are still not fully explored. This special topic aims to promote research and development related to innovative TNs technology from perspectives of fundamental theory and algorithms, novel approaches in machine learning and deep neural networks, and various applications in computer vision, biomedical image processing and many other related fields.

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