

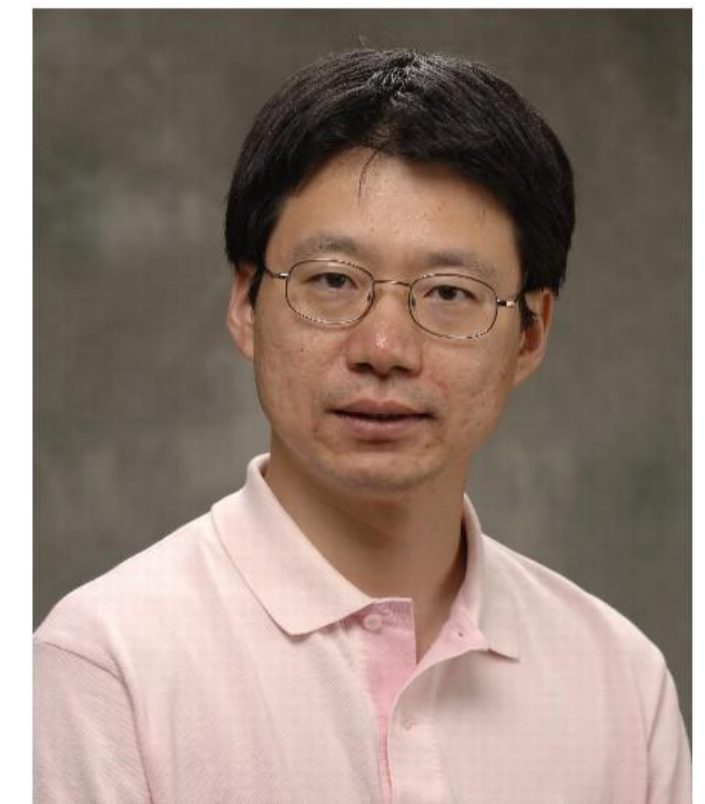


Feature Selection and Learning on High-Dimensional Data and Large-Scale Data

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Abstract

Diverse areas of scientific research and everyday life are now deluged with high-dimensional data and big data. There is an urgent need for large-scale data mining and prediction techniques. In this talk I will present our feature selection and learning methods capable of handling such data highly effectively and efficiently. The feature selection methods integrate intrinsic discriminative information and exploit global optimization techniques on Markov random fields, giving rise to a closed-form solution of linear complexity. The learning methods are built within our minimax pattern learning framework, going beyond the classic lasso-type sparse representation and possessing efficient complexity and fast convergence. I will show their superior performance, when compared with several state-of-the-art methods, in both predictive/recommending accuracy and efficiency. It is expected that these methods will have potentially a significant impact on various fields such as science and medicine.

Bio

Dr. Qiang Cheng received the BS and MS degrees from Math Department at Peking University, China, and the PhD degree from the Department of Electrical and Computer Engineering at the University of Illinois, Urbana-Champaign. Currently, he is a tenured associate professor at the Department of Computer Science at Southern Illinois University Carbondale. He previously was an AFOSR faculty fellow at the Air Force Research Laboratory, Wright-Patterson, Ohio, and a senior researcher and senior research scientist at Siemens Medical Solutions, Siemens Corporate Research, Siemens Corp., Princeton, New Jersey. His research interests include data science and analytics, signal and image processing, and biomedical informatics. He received various awards and privileges. He has a number of international patents issued or filed with the IBM T.J. Watson Research Laboratory, Siemens Medical, and Southern Illinois University Carbondale.