SEMINAR

Dr. Ying Vicky Liu

The State University of New York at Buffalo (SUNY)

Exploring Low-dimensionality in Multimedia Big Data

Tuesday, May 1, 2018

3:05 – 4:00 pm

Stocker Room #103

(light refreshments will be provided to Seminar attendees)

ABSTRACT

Multimedia data are characterized by their massive volume and high-dimensionality, which dominate the data deluge in today's big data era. While providing detailed information for target services, they also impose significant challenges in that current capability for processing the massive data volume, such as compression, transmission, reconstruction, and information extraction, is far less than the power of data generation. In this talk, I will present my efforts in developing theoretical frameworks to efficiently process these "Multimedia Big Data", by exploring their intrinsic low-dimensional structures such as sparsity and low-rankness. First, I will present the reconstruction of compressed-sensed multiview videos for pervasive 3D and free viewpoint video applications. The proposed method simultaneously utilizes image gradient, temporal correlation and inter-camera correlation for enhanced sparse representation, which leads to significantly improved reconstruction quality and offers robustness to frame occlusions/corruptions. In the second part of the talk, my focus shifts to compressed-sensed-domain $L1$-norm principal-component analysis ($L1$-PCA) for outlier-resilient video surveillance. This work posed a new theoretical basis for compressed-sensed-domain robust low-rank subspace learning and opened up a new application area for $L1$-PCA theory. Lastly, I will highlight the future research in multimedia big data as an essential element in the Internet-of-Things.

BIOGRAPHY

Ying Liu is a Research Scientist in the Department of Electrical Engineering, The State University of New York, University at Buffalo (SUNY at Buffalo). Her research lies at the intersection of signal processing, machine learning, and optimization, with applications in multimedia big data. She obtained her Ph.D. and M.S. degree in Electrical Engineering from SUNY at Buffalo in Sept. 2012 and June 2008, respectively, and a B.S. degree in Telecommunications Engineering from Beijing University of Posts and Telecommunications (BUPT), Beijing, China in 2006. She worked in ARCON Corporation, Waltham, MA in 2013 as a Staff Engineer, and in the Multimedia Communications Lab at Illinois Institute of Technology (IIT), Chicago, IL as a Senior Research Associate from July 2013 to Oct. 2014. Dr. Liu has 20 publications in prestigious journals and flagship conferences such as IEEE Trans. Circuits and Systems for Video Technology (TCSVT), IEEE Trans. Multimedia (TMM), SPIE Journal of Electronic Imaging (JEI), ICASSP, ICIP, SPIE Conf. DSS, and Asilomar Conference. She frequently serves as a reviewer for top-ranked journals such as TCSVT, TMM, IEEE Access, Neurocomputing, Ad Hoc Networks, Elsevier Journal of Visual Communication and Image Representation (JVCI), and JEI. She also served as the TPC member of multiple international conferences.