Title: Explicit Constructions of MDS Array Codes with Optimal Repair Bandwidth

Speaker: Dr. Min Ye, Princeton University

Time and location: Friday, April 20, 11am

Abstract:
Maximum distance separable (MDS) codes are optimal error-correcting codes in the sense that they provide the maximum failure-tolerance for a given number of parity nodes. Suppose that an MDS code with k information nodes and $r=n-k$ parity nodes is used to encode data in a distributed storage system. It is known that if h out of the n nodes are inaccessible and d surviving (helper) nodes are used to recover the lost data, then we need to download at least $h/(d+h-k)$ fraction of the data stored in each of the helper nodes (Dimakis et al., 2010 and Cadambe et al., 2013). If this lower bound is achieved for the repair of any h erased nodes from any d helper nodes, we say that the MDS code has the (h,d)-optimal repair property. In this talk, I will present explicit constructions of (n,k) MDS codes with $(1,d)$-optimal repair property for any given $k<=d<=n-1$. If time permits, I will also mention the constructions of MDS codes that can optimally repair $h>1$ erasures.

This talk is based on our paper "Explicit constructions of high-rate MDS array codes with optimal repair bandwidth" with Alexander Barg.

Bio:

Min Ye received the B.S. degree in Electrical Engineering from Peking University, Beijing, China in 2012, and the Ph.D. degree in the Department of Electrical and Computer Engineering, University of Maryland, College Park in 2017. His research interests include coding theory and information theory.