



## Fall 2017 Colloquium Department of Computer and Information Sciences

### *High Performance NVM-based Storage System*

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**Abstract:** High performance computing requires storage system with huge capacity, high bandwidth, low access latency and good energy efficiency. Emerging technologies, such as nonvolatile memories (NVMs) are playing a more and more important role in high performance computing systems for lower power consumption and better scalability. The use of NVMs, however, has brought great opportunities as well as challenges to redesign the traditional storage architecture. In this talk, the weak points of existing NVMs including PCM, STT-RAM and RRAM will be reviewed. Then, the hardware and software challenges for applying emerging NVMs in computer architecture and storage system are presented and discussed. Keeping in mind these challenges, this talk will summarize recent developments of our group in high performance NVM-based storage system from hardware level (NVM-based storage devices, read and write optimizations in NVM) to software level (Object-based NVM Management, NVM-based File System and Metadata Accelerator with NVM). Experiment results show that the advantage of NVM is enhanced and the disadvantage is avoided by the hardware and software we have designed.

**Bio:** Dan Feng received her B.E, M.E. and Ph.D. degrees in Computer Science and Technology from Huazhong University of Science and Technology (HUST), China, in 1991, 1994 and 1997 respectively. She is a professor and Dean of the School of Computer Science and Technology, HUST. She is also the director of Data Storage System Division, Wuhan National Lab for Optoelectronics. Her research interests include computer architecture, solid-state storage techniques, large-scale network storage systems, parallel file systems, fault tolerance, RAID, etc. Her research has been supported by NSFC, National 973 Program, National 863 Program, CNGI program, etc. She holds the Distinguished Professorship of Changjiang Scholars and the Recipient of National Science Foundation for Distinguished Young Scholars. She has over 100 publications in journals and international conferences, including FAST, USENIX ATC, EuroSys, ICDCS, HPDC, SC, ICS, IPDPS, MSST, IEEE TC, IEEE TPDS, and ACM TOS.