

Colloquium

Department of Computer Science

Dr. Xiaolan (Sharon) Huang

Dr. Xiaolan Huang is a lecturer in the department of Computer Science, Southern Illinois University at Carbondale (SIUC). She received her PhD degree in Computer Science from SIUC, her MS degree in Electrical and Computer Engineering from the University of Texas at Austin, her MS and BS degrees in Mechanical Engineering from Tsinghua University (China). She has extensive experience in academic research and industry (Cisco, Broadcom, Synopsys, Motorola, etc). Her current research interest is in high performance computing, big data, bioinformatics, and computational biology. Her research is being funded by the National Institute of Health (NIH).

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11:00 AM

Engineering Building A, Room 310

HIGH PERFORMANCE COMPUTING IN BIOINFORMATICS

Abstract

Recent breakthroughs in many fronts of life science research have led to the exponential growth of biological data. On the other side, rapid progress in the high performance computing (HPC) arena provides an ever-increasing computational power that was unimaginable before. The integration of these latest developments opens up great opportunities in the computational simulation and analysis of relevant biological systems. The interdisciplinary efforts have created the new research field of Bioinformatics, defined most broadly as informatics in the domains of life sciences. Bioinformatics enables remarkable advances in the fields of genome research, drug discovery, healthcare, etc., and is helping to create new personalized therapeutic strategies for living longer and healthier. My goal is to establish a Bio-HPC lab with a focus on the application of HPC technology to solve important biological and biomedical problems. I will discuss the development of a dedicated Bio-HPC cluster that is funded by NIH. I will also present three specific, HPC-enabled research projects including: 1) Parallel algorithm and software for identification of new CRISPR-Cas systems as potential gene editing tools; 2) RNA pseudoknots and related structures in the regulation of gene expression; 3) structure-based drug development. I will also briefly discuss my philosophy and plans for teaching and training students in the HPC and bioinformatics areas.