

2023-2024 CRLC Seminars at UAA

Cybersecurity Research: A Data Science Perspective @ Fri Dec 1, 2023 12pm - 1:30pm (AKST)

Presenter: Ms. Celeste Matarazzo, Principal Investigator and Researcher, Lawrence Livermore National Laboratory (LLNL)

Seminar Abstract: As all aspects of our lives become increasingly dependent on computing networks and the Internet, cybersecurity has grown from a localized economic problem to a major national imperative. Situational awareness of computer networks presents many challenges including but not limited to the volume of the data and the dynamic and evolving nature of the problem space. For example, at the perimeter of a corporate enterprise computer network, it is common to see terabytes of network traffic each day, containing millions of unique IP addresses and connection records that number in the hundreds of millions. Celeste will provide an overview and discuss recent trends facing computer security researchers and practitioners. She will describe recent work at Lawrence Livermore National Laboratory to enable analysis of computer networks and encourage an interactive discussion to foster new ideas to address these challenges.

Presenter Biography: Celeste Matarazzo is a computer scientist and data science expert with more than 30 years of service to the Lawrence Livermore National Laboratory (LLNL). Celeste is the Principal Investigator and Researcher in cybersecurity situational awareness. As a cyber security researcher, she is working with national laboratory, industrial and academic partners to develop game-changing tools and techniques to enhance security in a networked world. Celeste previously held numerous technical and leadership roles throughout her career at LLNL focusing on the application of data science to address global security issues. When not working, she is an avid backpacker and bicyclist who achieved a long-time goal in 2005 when she completed a 3,850-mile transcontinental bicycle journey from San Francisco to Virginia Beach raising money for Hope Hospice.

The Future of Computing Beyond Moore's Law @ Fri Feb 9, 2024 12pm - 1:30pm (AKST)

Presenter: Mr. John Shalf, Department Head for Computer Science, Lawrence Berkeley National Laboratory (LBNL)

Seminar Abstract: Moore's Law is a techno-economic model that has enabled the information technology industry to double the performance and functionality of digital electronics roughly every 2 years within a fixed cost, power and area. Advances in silicon lithography have enabled this exponential miniaturization of electronics, but, as transistors reach atomic scale and fabrication costs continue to rise, the classical technological driver that has underpinned

Moore's Law for 50 years is failing and is anticipated to flatten by 2025. This talk provides an updated view of what a post-exascale system will look like and the challenges ahead, based on our most recent understanding of technology roadmaps. It also discusses the tapering of historical improvements, and how it affects options available to continue scaling of successors to the first exascale machine. Lastly, it covers the many different opportunities and strategies available to continue computing performance improvements in the absence of historical technology drivers. These trends impact the development of future Numerical algorithms for high-performance computational science as well as programming systems and the performance analysis of scientific computing codes.

Presenter Biography: John Shalf is Department Head for Computer Science Lawrence Berkeley National Laboratory, and recently was deputy director of Hardware Technology for the DOE Exascale Computing Project. Shalf is a coauthor of over 80 publications in the field of parallel computing software and HPC technology, including three best papers and the widely cited report *The Landscape of Parallel Computing Research: A View from Berkeley* (with David Patterson and others). He also coauthored the 2008 *ExaScale Software Study: Software Challenges in Extreme Scale Systems*, which set the Defense Advanced Research Project Agency (DARPA's) information technology research investment strategy. Prior to coming to Berkeley Laboratory, John worked at the National Center for Supercomputing Applications and the Max Planck Institute for Gravitation Physics Albert Einstein Institute (AEI) where he was co-creator of the Cactus Computational Toolkit.