

Solving Global Grand Challenges with High Performance Data Analytics



Speaker: David A. Bader

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Time: 5:00 PM – 6:00 PM (EST)

Place: Zoom: <https://wvu.zoom.us/j/9188836315>

Abstract: Data science aims to solve grand global challenges such as: detecting and preventing disease in human populations; revealing community structure in large social networks; protecting our elections from cyber-threats and improving the resilience of the electric power grid. Unlike traditional applications in computational science and engineering, solving these social problems at scale often raises new challenges because of the sparsity and lack of locality in the data, the need for research on scalable algorithms and architectures, and development of frameworks for solving these real-world problems on high performance computers, and for improved models that capture the noise and bias inherent in the torrential data streams. In this talk, Bader will discuss the opportunities and challenges in massive data science for applications in social sciences, physical sciences, and engineering.

Biography: David A. Bader is a Distinguished Professor and founder of the Department of Data Science and inaugural Director of the Institute for Data Science at New Jersey Institute of Technology. Prior to this, he served as founding Professor and Chair of the School of Computational Science and Engineering, College of Computing, at Georgia Institute of Technology. Dr. Bader is a Fellow of the IEEE, ACM, AAAS, and SIAM; a recipient of the IEEE Sidney Fernbach Award; and the 2022 Innovation Hall of Fame inductee of the University of Maryland's A. James Clark School of Engineering. He advises the White House, most recently on the National Strategic Computing Initiative (NSCI) and Future Advanced Computing Ecosystem (FACE). Bader is a leading expert in solving global grand challenges in science, engineering, computing, and data science. His interests are at the intersection of high-performance computing and real-world applications, including cybersecurity, massive-scale analytics, and computational genomics, and he has co-authored over 300 scholarly papers and has best paper awards from ISC, IEEE HPEC, and IEEE/ACM SC. Dr. Bader has served as a lead scientist in several DARPA programs including High Productivity Computing Systems (HPCS) with IBM, Ubiquitous High Performance Computing (UHPC) with NVIDIA, Anomaly Detection at Multiple Scales (ADAMS), Power Efficiency Revolution For Embedded Computing Technologies (PERFECT), Hierarchical Identify Verify Exploit (HIVE), and Software-Defined Hardware (SDH). Recently, Bader received an NVIDIA AI Lab (NVAIL) award, and a Facebook Research AI Hardware/Software Co-Design award. Dr. Bader is Editor-in-Chief of the ACM Transactions on Parallel Computing, and General Co-Chair of IPDPS 2021, and previously served as Editor-in-Chief of the IEEE Transactions on Parallel and Distributed Systems. He serves on the leadership team of Northeast Big Data Innovation Hub as the inaugural chair of the Seed Fund Steering Committee. ROI-NJ recognized Bader as a technology influencer on its 2021 inaugural and 2022 lists. In 2012, Bader was the inaugural recipient of University of Maryland's Electrical and Computer Engineering Distinguished Alumni Award. In 2014, Bader received the Outstanding Senior Faculty Research Award from Georgia Tech. Bader is a member of Tau Beta Pi (National Engineering Honor Society), Eta Kappa Nu (Electrical Engineering Honor Society), and Omicron Delta Kappa (National Leadership Honor Society). Bader has also served as Director of the Sony-Toshiba-IBM Center of Competence for the Cell Broadband Engine Processor and Director of an NVIDIA GPU Center of Excellence. In 1998, Bader built the first Linux supercomputer that led to a high-performance computing (HPC) revolution, and Hyperion Research estimates that the total economic value of Linux supercomputing pioneered by Bader has been over \$100 trillion over the past 25 years. Bader is a cofounder of the Graph500 List for benchmarking "Big Data" computing platforms. He is recognized as a "RockStar" of High Performance Computing by InsideHPC and as HPCwire's People to Watch in 2012 and 2014.

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