NJIT | Institute for Data Science

Future of AI: Silver Linings, a Touch of Grey

Artificial intelligence, data science, and the emerging field of quantum computing are among the hottest research topics in computing overall. David Bader shared his thoughts recently in an interview on big-picture questions about each area. Bader is known globally for his innovative work in history and cutting-edge computing. In 2023 David was recognized by the Computer History Museum for developing a Linux supercomputer using commodity hardware.

OVERVIEW:

- Student & Faculty Updates
- Recent Awards
- Publications

Center for AI Research

Center for Big Data

Cybersecurity Research Center

Structural Analysis of Biomedical Ontologies Center (SABOC)

Cybersecurity Research Center

New Research Contract:

Cong Shi, "Enabling Reliable and Adaptive AI on Security-Critical Applications by Handling Out-of-distribution Data"

Funding source: Army Research Office

Recent Publications:

Yuxin (Myles) Liu, Zhihao Yao, Mingyi Chen, Ardalan Amiri Sani, Sharad Agarwal, and Gene Tsudik, "ProvCam: A Camera Module with Self-Contained TCB for Producing Verifiable Videos", in Proceedings of the 30th Annual International Conference On Mobile Computing And Networking (ACM MobiCom 2024). To read the publication click here.

Shufan Zhang, Xi He, Ashish Kundu, Sharad Mehrotra, and Shantanu Sharma, "Secure Normal Form: Mediation Among Cross Cryptographic Leakages in Encrypted Databases", in IEEE International Conference on Data Engineering (ICDE), 2024. To read the publication click here.

Tianfang Zhang, Huy Phan, Zijie Tang, Cong Shi, Yan Wang, Bo Yuan, and Yingying Chen,"Inaudible Backdoor Attack via Stealthy Frequency Trigger Injection in Audio Spectrogram", in Proceedings of the 30th Annual International Conference On Mobile Computing And Networking (ACM MobiCom 2024). To read the publication click here.

Changming Li, Mingjing Xu, Yicong Du, Limin Liu, Cong Shi, Yan Wang, Hongbo Liu, and Yingying Chen, "Practical Adversarial Attack on WiFi Sensing Through Unnoticeable Communication Packet Perturbation", in Proceedings of the 30th Annual International Conference On Mobile Computing And Networking (ACM MobiCom 2024). To read the publication click here.

CENTER ACTIVITIES

Structural Analysis of Biomedical Ontologies Center (SABOC)

25th Annual International Conference on Digital Government Research
Internet of Beings: Transforming Public Governance

Best Poster Award

"Continous Evaluation for a Multi-Dimensional Violent Crime Prevention and Recovery Policy" authors: James Geller, Angela Garretson, and Soon Ae Chun

James Geller along with his co-authors were awarded a Best Paper Award during the proceedings of the 25th Annual International Conference on Digital Government Research. The event was titled "Internet of Beings: Transforming Public Governance and took place at National Taiwan University, Taipei, Taiwan. To learn more about the conference click here.

INSTITUTE ACTIVITIES

Recent Publications:

Fernando Vera Buschmann, Palina Pauliuchenka, Ethan Oh, Bai Chien Kao, Louis DiValentin, David A. Bader (2024). Graph-Based Profiling of Dependency Vulnerability Remediation. SciSec 2024. To read the publication click here.

Alexander M. Dalzell, B. David Clader, Grant Salton, Mario Berta, Cedrick Yen-Yu Lin, David Bader, William J. Zeng (2024). Quantum interior point method (US20240144066A1). USPTO. To read the publication click here.

Recent Publications Continued:

"On the Design of Graph Analytical Software in Chapel," Oliver Alvarado Rodriguez, Zhihui Du, and David A. Bader, The 11th Annual Chapel Implementers and Users Workshop (ChapelCon), Virtual, June 5-7, 2024. Learn More.

Conference Talks:

"Arachne: A Productive Massive-Scale Graph Analytics Framework," Oliver Alvarado Rodriguez, Zhihui Du, and David A. Bader, Minisymposium on Large Scale Graph Analytics, The 20th SIAM Conference on Parallel Processing for Scientific Computing (PP24), Baltimore, MD, March 5, 2024.

"Large-Scale Graph Analytics for Connectomics," David A. Bader, Connectomics Conference 2024, Harnack-Haus of the Max Planck Society, Berlin, Germany, June 18, 2024. Learn More.

Bader Keynote and Seminar talks:

"Solving Global Grand Challenges with High Performance Data Analytics," IEEE Webinar, West Virginia University, February 5, 2024.

"Solving Global Grand Challenges with High Performance Data Analytics," 13th Annual Quinnipiac University Sigma Xi Conference, Hamden, CT, April 24, 2024.

"Arachne: An Open-Source Framework for Interactive Massive-Scale Graph Analytics," Keynote Talk, The 21st Annual Workshop on Charm++ and Its Applications, University of Illinois Urbana-Champaign, April 26, 2024.

"Arachne: An Open-Source Framework for Interactive Massive-Scale Graph Analytics," Computer Science & Engineering Department Seminar Talk, Lehigh University, Bethlehem, PA, May 1, 2024.

NJIT's David Bader on the Future of AI:
Silver Linings, a Touch of Grey

written by: Evan Koblentz
link to Full article

Artificial intelligence, data science, and the emerging field of quantum computing are among the hottest research topics in computing overall. David Bader, a distinguished professor in NJIT's Ying Wu College of Computing and director of the university's Institute for Data Science, shared his thoughts on big-picture questions about each area. Bader is known globally for his innovative work in the history and cutting-edge of computing.

In 2023 you were recognized by the Computer History Museum for developing a Linux supercomputer using commodity hardware. Your approach is now the dominant method in high-performance computing. Was that a life-shaping lesson for you in not being afraid to try unconventional things? How do you explain this lesson to your students?

Certainly, being recognized by the Computer History Museum for my early work in developing a Linux supercomputer using commodity hardware was a pivotal moment in my career, and it underscored a fundamental lesson that has shaped not only my approach to computing but also how I mentor and teach. In the world of research and innovation, the courage to explore unconventional paths is often the key to groundbreaking discoveries. This project was a testament to that belief. At a time when the idea of assembling a supercomputer from off-the-shelf components was unconventional, I saw an opportunity to democratize access to high-performance computing. It was a venture into the unknown, leveraging the emerging potential of Linux and commodity hardware to build something that was both accessible and powerful. This experience taught me the importance of embracing risk and the value of resilience. There were technical hurdles, skepticism from peers and the daunting task of venturing beyond established norms. continue.

Expert on government-commissioned AI threat report: A lot of hype, but a good plan

writen by: Ian Krietzberg (a tech reporter for The Street)

The Street spoke with David Bader about a report published by Gladstone AI Gladstone AI published a report — commissioned for $250,000 by the U.S. State Department — that detailed the apparent "catastrophic" risks posed by untethered artificial intelligence technology. It was first reported on by Time.

The report, the result of more than 200 interviews with AI researchers, leading AI labs and prominent AI executives, was conducted by Gladstone's Edouard Harris, Jeremie Harris and Mark Beall over the past year. It warns that, if it remains unregulated, AI could "pose an extinction-level threat to the human species."

The report, which TheStreet reviewed in full, focuses on two key risks: the weaponization of AI and a potential loss of human control. In terms of weaponization, the report warns that models can be used to power everything from mass disinformation campaigns to large-scale cyberattacks, going on to suggest that advanced, future models might be able to assist in the creation of biological weaponry.

The risk of control, according to the report, is based on future, highly advanced (and theoretical) models that, in achieving "superhuman" capabilities, "may engage in power-seeking behaviors," becoming " effectively uncontrollable."

Though the report says there is evidence to support this, the report does not explore that evidence. Read the full article click here.
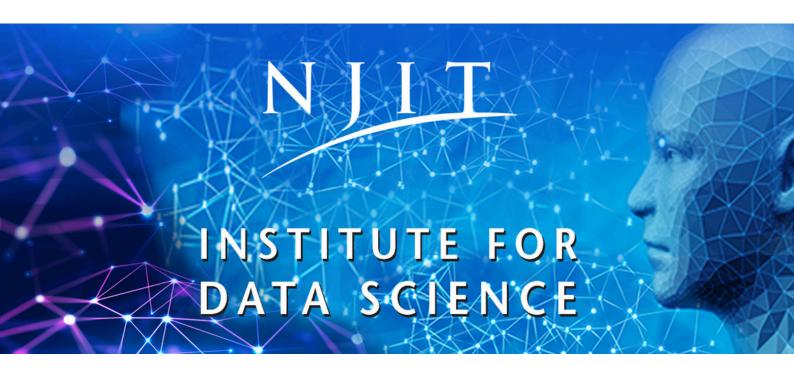
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