Michael "Jeff" Donahoo

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Education

Ph.D., Computer Science	1998	Georgia Institute of Technology
M.S., Computer Science	1993	Baylor University
B.S., Computer Science	1991	Baylor University

Experience

Aug. 2024 to Present Belmont University
Professor of Computer Science

Jun. 1998 to Aug. 2024 Baylor University
Professor of Computer Science

May. 2022 to Aug. 2024 Central Texas Cyber Range
Central Texas Cyber Range (CTCR) Director of Research and Development

Jun. 2002 to Apr. 2024 ICPC Headquarters
Deputy Executive Director of the ICPC
Executive Director of World Finals
Executive Director of North America Championship
Director of ICPC HQ Services

Sept. 1996 to Jun. 1998 Georgia Institute of Technology
Graduate Research Assistant, Telecomm Group

Peer Reviewed Publications

- Ernesto Quevedo Caballero, Michael J. Donahoo, and Tomas Cerny. Fairness Analysis of Deep Reinforcement Learning based Multi-Path QUIC Scheduling, SAC '23: Proceedings of the 38th ACM/SIGAPP Symposium on Applied Computing, Pages 1772–1781, March 2023.
- Rohit Singh, Shaun Hutton, Michael J. Donahoo, and Douglas Sicker. Toward Grading Cybersecurity & Resilience Posture for Cyber Physical Systems. SSRN. 2021.
- Tomas Cerny, Michael J Donahoo. Survey on Compromise-Defensive System Design. International Conference on Information Science and Applications, pgs. 513-521, 2019.
- Tomas Cerny, Filip Sedlisky, Michael J Donahoo. On Isolation-driven Automated Module Decomposition. Proceedings of the Conference on Research in Adaptive and Convergent Systems, pgs. 302-307, 2018.

- Safwan Malwood Hussein, Michael J Donahoo, Tomas Cerny. Security Challenges in Smart City Applications. International Conference on Security and Management. CSREA Press, pgs. 306-310, 2018.
- Tomas Cerny, Michael J Donahoo, Michal Trnka. Contextual Understanding of Microservice Architecture: Current and Future Directions. ACM SIGAPP Applied Computing Review, 17 (4), pgs. 29-45, 2018.
- Tomas Cerny, Michael J Donahoo. Second Screen Engagement of Event Spectators. Advances in Human-Computer Interaction, 2018.
- Tomas Cerny, Michael J. Donahoo, Jiri Pechanec. Disambiguation and Comparison of SOA, Microservices and Self-Contained Systems. Proceedings of the International Conference on Research in Adaptive and Convergent Systems, RACS 2017, Krakow, Poland, ISBN 978-1-4503-5027-3, pgs. 228-235, 2017.
- Tomas Cerny, Michael J Donahoo. On energy impact of web user interface approaches. Cluster Computing, Vol. 19, Issue 4, pgs. 1853-1863, 2016.
- Tomas Cerny, Michal Trnka, Michael J Donahoo. Towards Shared Security through Distributed Separation of Concerns. Proceedings of the International Conference on Research in Adaptive and Convergent Systems, pgs. 169-172, 2016.
- Tomas Cerny, Michael J Donahoo. Survey on Second Screen Systems. Proceedings of the 6th International Conference on IT Convergence and Security (ICITCS), 2016.
- Karel Cemus, Tomas Cerny, Lubos Matl, Michael J Donahoo. Aspect, Rich, and Anemic Domain Models in Enterprise Information Systems. In Proceedings of SOFSEM: Theory and Practice of Computer Science, 2016.
- Tomas Cerny, Michael J Donahoo. Survey on Concern Separation in Service Integration. In Proceedings of SOFSEM: Theory and Practice of Computer Science, 2016.
- Tomas Cerny, Michael J Donahoo. Impact of Remote User Interface Design and Delivery on Energy Demand. In Proceedings of the International Conference on Information Science and Security (ICISS), 2015.
- Karel Cemus, Tomas Cerny, Michael J Donahoo. Evaluation of Approaches to Business Rules Maintenance in Enterprise Information Systems. In Proceedings of the Conference on Research in Adaptive and Convergent Systems, 2015.
- Karel Cemus, Tomas Cerny, Lubos Matl, Michael J Donahoo. Enterprise Information Systems: Comparison of Aspect-driven and MVC-like Approaches. In Proceedings of the Conference on Research in Adaptive and Convergent Systems, 2015.
- Tomas Cerny, Michael J Donahoo. On Separation of Platform-independent Particles in User Interfaces. In Proceedings of Cluster Computing, 2015.
- Tomas Cerny, Miroslav Macik, Michael J Donahoo, Jan Janousek. On Distributed Concern Delivery in User Interface Design. In Computer Science and Information Systems, 2015.
- Lubos Matl, Tomas Cerny, Michael J. Donahoo. Effective Manycast Messaging for Kademlia Network. In Proceedings of 30th ACM/SIGAPP Symposium On Applied Computing, 2015.
- Karel Cemus, Tomas Cerny, Michael J. Donahoo. Automated Business Rules Transformation into a Persistence Layer. Procedia Computer Science Journal, Elsevier, 2015.
- Tomas Cerny, Michael J.Donahoo. Separating out Platform-independent Particles of User Interfaces. In Proceedings of International Conference on Information Science and Applications, LNEE, Springer, 2015.

- Tomas Cerny, Lubos Matl, Karel Cemus, Michael J. Donahoo. Evaluation of Separated Concerns in Web-based Delivery of User Interfaces. In Proceedings of International Conference on Information Science and Applications, LNEE, Springer, 2015.
- Tomas Cerny, Miroslav Macik, Michael J. Donahoo, Jan Janousek. Description and Cache Performance in Aspect-Oriented User Interface Design. In Proceedings of the 2014 Federated Conference on Computer Science and Information Systems, ACSIS, volume 2, pages 1667–1676. IEEE Computer Society Press and Polish Information Processing Society, 2014.
- Tomas Cerny, M. Macik, Michael J. Donahoo, and J. Janousek. Efficient Description and Cache Performance in Aspect-Oriented User Interface Design. In Federated Conference on Computer Science and Information Systems, 2014. P. 1697–1706
- Tomas Cerny, K. Cemus, Michael J. Donahoo, Song, E., Aspect-driven, Data-reflective and Context-aware User Interfaces Design. In: ACM SIGAPP Applied Computing Review. 2013, vol. 13, no. 4, p. 53-65. Internet: http://www.sigapp.org/acr/Issues/V13.4/ACR-13-4-2013.pdf. ISSN 1559-6915.
- Tomas Cerny, Michael J. Donahoo, Song, E. Towards Effective Adaptive User Interfaces Design. In: RACS '13 Proceedings of the 2013 Research in Adaptive and Convergent Systems. New York: ACM, 2013, p. 373-380. ISBN 978-1-4503-2348-2.
- Tomas Cerny, Chalupa V., Michael J. Donahoo. Towards Smart User Interface Design. In Information Science and Applications (ICISA), 2012 International Conference on [CD-ROM]. New York: IEEE, 2012, p. 1-6. ISBN 978-1-4673-1402-2.
- Tomas Cerny, Chalupa V., and Michael J. Donahoo. Impact of User Interface Generation on Maintenance. In Computer Science and Automation Engineering (CSAE). Beijing: IEEE, 2012, p. 621-625. ISBN 978-1-4673-0088-9.
- Tomas Cerny, P. Praus, S. Jaromerska, L. Matl, and Michael J. Donahoo. Towards a Smart, Self-scaling Cooperative Web Cache. In SOFSEM 2012: Theory and Practice of Computer Science. New York: Springer, 2012, vol. 7147, p. 443-455. ISBN 978-3-642-27659-0.
- Tomas Cerny and Michael J. Donahoo. MetaMorPic: Self-Contained Photo Archival and Presentation (Book chapter). Information Systems Development Information Systems Development. Berlin: Springer Science+Business Media , 2011, p. 157-166. ISBN 978-1-4419-9645-9.
- Tomas Cerny, P. Praus, S. Jaromerska, L. Matl, and Michael J. Donahoo. Cooperative Web Cache, Proceedings of 18th International Conference on Systems, Signals and Image Processing. Sarajevo: University of Sarajevo, 2011, p. 85-88. ISBN 978-9958-9966-1-0.
- Tomas Cerny and Michael J. Donahoo. How to Reduce Costs of Business Logic Maintenance. Proceedings of IEEE International Conference on Computer Science and Automation Engineering. Beijing: IEEE, 2011, p. 1-6. ISBN 978-1-4244-8728-8.
- Tomas Cerný and Michael J. Donahoo. FormBuilder: A novel approach to deal with view development and maintenance. SofSem 2011 Proceedings of Student Research Forum. Bratislava: OKAT, 2011, p. 16-34. ISBN 978-80-88720-17-1.
- Paul T. Edelman, Michael J. Donahoo, and David B. Sturgill. Secure Group Communications for Delay-Tolerant Networks, IEEE International Conference for Internet Technology and Secured Transactions, 2010.
- Tomas Cerny and Michael J. Donahoo. Evaluation and Optimization of Web Application Performance Under Varying Network Conditions. Proceedings of 44th Spring International Conference MOSIS'X, 2010, p. 41-48. ISBN 978-80-86840-51-2.

- Tomas Cerny and Michael J. Donahoo. MetaMorPic: Self-contained Photo Archival and Presentation. Information Systems Development, 2010. Heidelberg: Springer.
- Tomas Cerny and Michael J. Donahoo. Performance Optimization for Enterprise Web Applications Through Remote Client Simulation, Proceedings of the 7th EUROSIM Congress on Modeling and Simulation, 2010. Praha: Czech and Slovak Simulation Society.
- Tomas Cerny and Michael J. Donahoo. A Tool for Evaluation and Optimization of Web Application Performance. Proceedings of 44th Spring International Conference MOSIS'X. Ostrava, 2010, p. 49-54. ISBN 978-80-86840-51-2.
- Michael J. Donahoo and Daniel Hernandez. Scheduling for Receiver-driven Multicast Flow Control. In Proceedings of International Conference on Communications in Computing, June 2002.
- Wai Gen Yee, Michael J. Donahoo, Edward Omiecinski, and Shamkant B. Navathe. Scaling Replica Maintenance in Intermittently Synchronized Databases. In Proceedings of CIKM, November 2001.
- J. William Murdock, Ashok K. Goel, Michael J. Donahoo, and Shamkant Navathe. A Framework for Method-specific Knowledge Compilation from Databases. Journal of Intelligent Information Systems, 17(1): 5--21, November 2001.
- J. William Murdock, Ashok K. Goel, Michael J. Donahoo, and Shamkant Navathe. Data Mining for Design and Manufacturing: Methods and Applications, vol. 3 of Massive Computing Series, chapter Method-Specific Knowledge Compilation. Kluwer Academic Publishers, 2001. 1-4020-0034-0.
- Michael J. Donahoo and Sunila R. Ainapure. Scalable Multicast Representative Member Selection. In Proceedings of INFOCOM, pages 259--268. IEEE, March 2001.
- Wai Gen Yee, Michael J. Donahoo, and Shamkant B. Navathe. A Framework for Server Data Fragment Grouping to Improve Server Scalability in Intermittently Synchronized Databases. In Proceedings of CIKM, pages 54--61, November 2000.
- Michael J. Donahoo, Mostafa H. Ammar, and Ellen W. Zegura. Multiple-channel Multicast Scheduling for scalable bulk-data transport. In INFOCOM'99, pages 847--855, March 1999.
- Michael J. Donahoo, Gary N. Boone, and Tucker Balch. On the Directional Correlation of Axial Rotation in Inverted Felines and Planetary Spin: Coriolis Revisited. The Journal of Irreproducible Results, 44(5-6):37--39, 1999.
- Michael J. Donahoo. Application-based Enhancements to Network-Layer Multicast. Ph.D. disseratation, Georgia Institute of Technology, Atlanta, GA, September 1998.
- J. W. Murdock, A. K. Goel, M. J. Donahoo, and S. B. Navathe. Method Specific Knowledge Compilation: Towards Practical Design Support Systems. In Proceedings of the Fifth International Conference on Artificial Intelligence and Design (AID'98), pages 427--444, July 1998.
- Sameer Mahajan, Michael J. Donahoo, Shamkant B. Navathe, and Mostafa Ammar. Grouping Techniques for Update Propagation in Intermittently Connected Databases. In Fourteenth International Conference on Data Engineering, pages 46--53. IEEE, February 1998.
- Ellen W. Zegura, Kenneth L. Calvert, and Michael J. Donahoo. A Quantitative Comparison of Graph-based models for Internet Topology. Transactions on Networking, 5(6):770--783, December 1997.
- Michael J. Donahoo, Kenneth L. Calvert, and Ellen W. Zegura. Center Selection and Migration for Wide-area Multicast Routing. Journal of High-Speed Networking, 6(2):141--164, 1997.

- Michael J. Donahoo, J. William Murdock, Ashok K. Goel, Shamkant B. Navathe, and Edward Omiecinski. From Data to Knowledge: Method-specific Transformations. In Proceedings of the Tenth International Symposium on Methodologies for Intelligent Systems (ISMIS'97), pages 411--420, October 1997.
- Michael J. Donahoo and Ellen W. Zegura. Core Migration for Dynamic Multicast Routing. In Proceedings of the ICCCN '96, pages 92--98. IEEE, IEEE Computer Society Press, October 1996.
- Kenneth L. Calvert, Ellen W. Zegura, and Michael J. Donahoo. Core Selection Methods for Multicast Routing. In Proceedings of the ICCCN '95, pages 638--642. IEEE, IEEE Computer Society Press, September 1995.
- Shamkant B. Navathe and Michael J. Donahoo. Towards Intelligent Integration of Heterogeneous Information Sources. In Proceedings of the 6th International Workshop on Database Re-engineering and Interoperability, March 1995.
- Michael J. Donahoo. Integration of Information in Heterogeneous Library Information Systems. Master's thesis, Baylor University, May 1993.
- Gregory Speegle and Michael J. Donahoo. Using Statistical Sampling for Query Optimization in Heterogeneous Library Information Systems. In Proceedings of the 21st Annual Computer Sciences Conference, pages 475--482, February 1993.

Books

I proposed and developed the Practical Guide series with Morgan-Kaufmann. The series consists of books for students and professional programmers who need a focused and fast-paced tutorial on a specific programming topic. The goal of these books is to get readers up-to-speed on the principles of the technology with clear examples, sample code, and straight-forward instruction. These books explore example-driven approaches to programming topics in the areas of networking, databases, web programming, and general programming, in a wide variety of computer languages. Currently, the series contains twelve books, four of which I co-authored. See http://jeffdonahoo.com/practical for details.

- Kenneth L. Calvert and Michael J. Donahoo. TCP/IP Sockets in C: Practical Guide for Programmers, Second Edition. Morgan Kaufmann, 2009.
- Kenneth L. Calvert and Michael J. Donahoo. TCP/IP Sockets in Java: Practical Guide for Programmers, Second Edition. Morgan Kaufmann, 2008.
- Michael J. Donahoo and Gregory D. Speegle. SQL: Practical Guide for Developers. Practical Guide Series. Morgan-Kaufmann, 2005.
- David Makofske, Michael J. Donahoo, and Kenneth L. Calvert. TCP/IP Sockets in C#: Practical Guide for Programmers. Practical Guide Series. Morgan-Kaufmann, 2004.
- Michael J. Donahoo and Kenneth L. Calvert. TCP/IP Sockets in C: Practical Guide for Programmers. Practical Guide Series. Morgan Kaufmann, 2002. Originally published in 2000 as The Pocket Guide to TCP/IP Sockets: C Version.
- Kenneth L. Calvert and Michael J. Donahoo. TCP/IP Sockets in Java: Practical Guide for Programmers. Practical Guide Series. Morgan Kaufmann, 2001.

Patent

S. Mahajan, M. J. Donahoo, S. Navathe, M. Ammar, F. McGeough, S. Malik, "Database Synchronization and Organization System and Method'" U.S. Patent 6,226,650, Filed: September 1998, Awarded: May 2001.

Funding

- Hutton, Shaun and Donahoo, Michael, "Central Texas Cyber Program (CTCP)," US Dept of Education, $1,500,000.00. Grant Award: P116Z230151. (Date of Funding: June 1, 2023 - May 31, 2026).
- Hutton, Shaun and Donahoo, Michael, "Central Texas Cyber Initiative (CTCI)," Sponsored by US Dept of Education, $999,997.00. Grant Award: P116Z220034. (Date of Funding: September 1, 2022 - August 31, 2024).
- Navy, **Subject:** RE: Project #1001400 L-3 Harris-Navy C130
- AFWERX (Air Force) grant ($50K) related to cyber resiliency, Jan 2021
- ICPCNews, Cisco, 2016-2017: $400,000.
- ICPC Funding, IBM, 2011-2017: Approximately $12,000,000 ($6,161,600 direct funding + in-kind support).
- Academic Contest Infrastructure Initiative Grant, IBM, 2011-2017: $2,240,000 + in-kind support.
- Academic CII Equipment, IBM, 2012-2017: Approximately $1,140,000 plus maintenance for 6 years.
- CLI Virtual Data Center, IBM, 2008: $615,600 plus maintenance for 5 years.
- ICPC Funding, IBM, 2003-2010: Approximately $8,000,000 ($4,097,100 direct funding + in-kind support).
- Academic Contest Infrastructure Initiative Grant, IBM, 2003-2010: $1,099,000 + in-kind support.
- Texas Infrastructure Fund Board Grant, 2002-2003: $18,000.
- Infocom Corporate Travel Grant, 2001: $1,000.
- A Flexible End-to-End Protocol Framework, NSF Subcontract from University of Kentucky, 2001: $12,000.
- Developing a Prototype Assessment Database Tool for Water Quality Management, Summer Sabbatical 2001.
- Performance Analysis of Data Aggregation Approaches for Update Propagation In Intermittently Connected Database Systems, Summer Sabbatical 1999.
- Scaling Update Propagation in Intermittently Connected Database Systems, University Research Committee Grant, 1999: $2,000.

Activities

Baylor Cybersecurity Program: Co-created/developed interdisciplinary cybersecurity program at Baylor University involving Computer Science, Business (MIS), Engineering, Mathematics, and Political Science. Program includes tracks within CS and MIS, graduate (MS and Ph.D.) programs, and cybersecurity degree (data science). Developed and coached cybersecurity competition teams in both offensive and defensive competitions. Developed an externally-funded lab and private cloud for

research and education. Created successful NSA CAE-CD and assisted in CAE-R designation applications.

Computing for Compassion (C4C): Co-created/directed C4C student organization. C4C serves established, compassion-based ministries by identifying the barriers that most limit their efforts.

ICPCNews: Co-created ICPCNews as a vehicle for globally promoting the message about the ICPC community. ICPCNews consists of professionals from around the world who volunteer to share the accomplishments and contributions of the ICPC community through story, photo, video, live coverage, and social media. The social media channel operates year-round with media impression of over 18 million during the World Finals. In addition, I designed MyICPC, a social engagement platform used at World Finals and several ICPC regional contests globally. Photographs from ICPCNews are featured in publications around the world in both web and print. Videos distributed over YouTube, etc. and in the ICPCLive broadcast are seen by tens of thousands around the globe.

Teaching

- Data Communication (CSI4321) – Undergraduate introduction to networking covering networking fundamentals, network security, and TCP/UDP socket programming. I developed this as a completely new course, and it is now part of the CS core curriculum.
- Advanced Data Communications (CSI5321) – Graduate course covering 1) a survey of seminal and current networking research, 2) core TCP/IP protocols in detail, and 3) advanced network programming. I developed this as a completely new course, and it is now a "systems" courses in the MSCS.
- Introduction to Operating Systems (CSI4337) – Operating system design and implementation. Topics include process control and synchronization, memory management, processor scheduling, file systems, and security.
- Introduction to Computer Science II (CSI1440) – Continuation of Introduction to Computer Science I. Introduction to basic aspects of arrays, pointers, classes, inheritance, polymorphism, virtual functions, linked lists, stacks, queues, and binary trees.
- Introduction to Cybersecurity (CSI4v96/5v96) – Concepts in cybersecurity, including cryptography, algebra (groups, rings, fields, etc.), authentication/access, intrusion, DoS, routing, firewall, malware, risk assessment/management, auditing, defensive programming, etc. Developed separate undergraduate and graduate versions of this course.
- Competitive Cybersecurity (CSI4v96) - Training course in Cybersecurity to provide experience in various areas in systems architecture and security. Each week system/security concepts are reviewed, and the student apply these to specific systems. Students should be able to demonstrate 1) general knowledge in all systems/services, 2) deep knowledge in targeted system and service, 3) teamwork, and 4) system defense/compromise.
- Discovering Series – As part of my classes, I developed a set of laboratory texts designed to ground course concepts. Thus far, I have not sought to publish these texts; they are provided as handouts to the students each semester.
  - Discovering TCP/IP – TCP/IP protocol description, packet analysis, and network systems with laboratory exercises designed to reinforce lecture. Includes 15 chapters covering packet analysis, Ethernet, IP, ARP, ICMP, UDP, TCP (reliability, flow/congestion control, etc.), DNS, DHCP, and HTTP. This is given to undergraduate Data Communications students.
  - Discovering Operating Systems – Multiple laboratory exercises demonstrating system administration, OS modification/recompilations, system fundamentals, and virtualization (machine, container, and serverless). This is given to undergraduate OS students.
  - Discovering Security – Multiple laboratory exercises demonstrating system vulnerabilities and tools for discovery and exploitation. This is given to students in the Introduction to Cybersecurity class.

Awards

- 2018 Outstanding Professor, Teaching, Baylor University
- 2016 Mark Measures Award, ICPC
- 2014 University of Warsaw Medal, University of Warsaw
- 2011 Joseph S. DeBlasi Outstanding Contribution Award, ICPC

- 2008 Outstanding Professor, Teaching, Baylor University