

MICAH BECK

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Education

- May 1992 Ph.D., Computer Science, Cornell University, Ithaca, New York.
Dissertation: "Translating FORTRAN to Dataflow Graphs."
Advisor: Keshav Pingali.
- May 1980 M.S., Computer Science, Stanford University, Palo Alto, California.
- June 1979 B.A. with honors, Mathematics and Computer Science, University of Wisconsin, Madison.

Employment

- 1998 – present Research Associate Professor / Associate Professor
1992 – 98 Assistant Professor
Department of Electrical Engineering and Computer Science, University of Tennessee, Knoxville, TN.
- 2005 – 2007 Joint appointment with Oak Ridge National Laboratory, Future Technologies Group
- 2000 – 2005 Chief Scientist & Founder, Lokomo Systems, Stockholm, Sweden. Content delivery.
- 1991 – 92 Visiting Assistant Professor, School of Computer and Information Science, Syracuse University, Syracuse, NY.
- 1990 – 91 Software Engineer, Isis Distributed Systems, Ithaca, NY. Research and development in distributed operating systems and networking.
- 1985 – 86 Member of Technical Staff/Consultant, Bell Communications Research, Morristown, NJ. Research in distributed sorting.
- 1983 – 84 Consultant, Quantum Science Corporation, New York, NY. Analyzed computer technology and markets.
- 1979 – 83 Member of Technical Staff, Bell Laboratories, Murray Hill, NJ. Research in distributed operating systems.

Professional Activities

- 1997 – 2005 Chair of the Internet2 Special Interest Group on Network Storage

Micah Beck: Publications

Refereed Journals

- Jian Huang, Huadong Liu, Micah Beck, Andrew Gaston, Jinzhu Gao, Terry Moore 2007, "Dynamic Sharing of Large-Scale Visualization," *IEEE Computer Graphics and Applications*, pp.20-25, Volume 27, No. 1
- D.A. Batchelor, M. Beck, A. Becoulet, R.V.Budney, C.S.Change, P.H.Diamond, J.W.Dong, G.Y.Fu, A. Fukuyama T.S. Hahm, D.E. Keyes, Y. Kishimoto, S. Klasky, L.L.Lao, K.Li, Z.Lin, B.Ludaescher, J.Manickam, N.Nakajima, T.Ozeki, N.Podhorszki, W.M.Tang, M.A.Vouk, R.E.Waltz, S.J.Wang, H.R.Wilson, X.Q.Xu, M.Yagi, F.Zonca 2007, *Plasma Science and Technology, Simulation of Fusions Plasmas: Current Status and Future Direction*, pp312-387, Vol. 9, No. 3
- A. Bassi, M. Beck, F. Chanussot, J.P. Gelas, R. Harakay, L. Lefevre, T. Moore, J. Plank and P. Primet, "Active and Logistical Networking for Grid Computing: the e-Toile Architecture," *Future Generation Computer Systems* 21, (1), January 2005, pp 1-246. Elsevier.
- Scott Atchley, Stephen Soltesz, James S. Plank, and Micah Beck, "Video IBPster," *Future Generation Computer Systems*, 19(6), August 2003, pp 861-870. Elsevier.
- Alessandro Bassi, Micah Beck, Terry Moore, James S. Plank, Martin Swany, Rich Wolski, and Graham Fagg, "The Internet Backplane Protocol: A Study in Resource Sharing," *Future Generation Computing Systems*, 19(4), May 2003, pp 551-561. Elsevier.
- Scott Atchley, James S. Plank, Micah Beck, and Ying Ding, "Algorithms for High Performance, Wide-Area Distributed File Downloads," *Parallel Processing Letters*, 13(2), June 2003, pp. 207–223. World Scientific Publishing Company.
- Micah Beck, Terry Moore, Leif Abrahamsson, Christophe Achouiantz, and Patrik Johansson, "Enabling Full Service Surrogates Using the Portable Channel Representation," *Computer Networks*, 39(5), August 5, 2002, pp. 559-576. Elsevier.
- James S. Plank, Alexander Bassi, Micah Beck, Terence Moore, D. Martin Swany, and Rich Wolski, "Managing Data Storage in the Network," *IEEE Internet Computing*, 5(5), September/October 2001, pp. 50-58.
- James S. Plank, Henri Casanova, Micah Beck and Jack Dongarra, "Deploying Fault Tolerance and Task Migration with NetSolve," *Future Generation Computer Systems*, 15(5-6), October 1999, pp. 745-755. Elsevier.
- Micah Beck, Jack Dongarra, Graham Fagg, G. Al Geist, Paul Gray, Jim Kohl, Mauro Migliardi, Keith Moore, Terry Moore, Phil Papadopoulos, Stephen L. Scott, and Vaidy Sunderam, "HARNESS: A Next Generation Distributed Virtual Machine," *Future Generation Computer Systems*, 15(5-6), October 1999, pp. 571-582. Elsevier.
- Micah Beck, Henri Casanova, Jack Dongarra, Terry Moore, James S. Plank, Fran Berman, and Rich Wolski, "Logistical Quality of Service in NetSolve," *Computer Communications*, 22(11), July 1999, pp. 1034-1044. Elsevier.
- James S. Plank, Yuqun Chen, Kai Li, Micah Beck and Gerry Kingsley, "Memory Exclusion: Optimizing the Performance of Checkpointing Systems," *Software -- Practice*

and Experience, 29(2), February 1999, pp. 125-142. J Wiley.

- Micah Beck and Terry Moore, "The Internet2 Distributed Storage Infrastructure Project: An Architecture for Internet Content Channels," *Computer Networks and ISDN Systems*, 30(22-23), 1998, pp. 2141-2148.
- James S. Plank, Micah Beck and Gerry Kingsley, "Compiler-Assisted Memory Exclusion for Fast Checkpointing," *IEEE Technical Committee on Operating Systems and Application Environments*, 7(4), Winter 1995, pp. 10-14.
- Micah Beck and Anatole Beck, "Revenge of the Linear Search Problem," *SIAM Journal on Control and Optimization*, 30(1), 1992.
- Micah Beck and Keshav Pingali, "From Control Flow to Dataflow," *Journal of Parallel and Distributed Computing*, Vol 12, 1991. Elsevier.
- Micah Beck, Keshav Pingali, and Alexandru Nicolau, "Static Scheduling for Dynamic Dataflow Machines," *Journal of Distributed and Parallel Computing*, 10(4), 1990. Elsevier.
- Micah Beck, T.K. Srikanth and Sam Toueg, "Implementation Issues in Clock Synchronization," *Fault Tolerant Distributed Computing*, LNCS, Vol 448, 1990. Springer Verlag.
- Micah Beck and A. Siegel, "TransFig: Portable Figures for TeX," *TUGboat*, 11(3), September 1990, pp. 373-380.
- Micah Beck, Dina Bitton and W. Kevin Wilkinson, "Sorting Large Files on a Backend Multiprocessor," *IEEE Transactions on Computers*, 37(7), July 1988, pp. 769-778.
- Micah Beck and Anatole Beck, "The Linear Search Problem Rides Again," *Israel Journal of Mathematics*, 53(3), 1986, pp. 365-372.
- Micah Beck and Anatole Beck, "Son of the Linear Search Problem," *Israel Journal of Mathematics*, 48(2-3), 1984, pp. 109-122.

Book Chapters

- Svetlana Y. Mironova, Michael W. Berry, Scott Atchley, Micah Beck, Tianhao Wu, Lars E. Holzman, William M. Pottenger, Daniel J. Phelp, "Advancements in Text Mining," In *Data Mining: Next Generation Challenges and Future Directions*, H. Kargupta, A. Joshi, K. Sivakumar, and Y. Yesha (Eds.), AAAI/MIT Press, Menlo Park, CA, 2003.
- Micah Beck, Terry Moore, James S. Plank and Martin Swany, "Logistical Networking: Sharing More Than the Wires," In *Active Middleware Services*, Salim Hariri, Craig A. Lee, and Cauligi S. Raghavendra (Eds.), Kluwer Academic, Norwell, MA, 2000.

Refereed Conference Papers

- Huadong Liu, Micah Beck, Jian Huang, "Dynamic Co-Scheduling of Distributed Computation and Replication," *IEEE International Symposium on Cluster Computing and the Grid*, Singapore, May 2006.
- Jonghyun Lee, Robert Ross, Scott Atchley, Micah Beck, Rajeev Thakur, "MPI-IO/L: Efficient Remote I/O for MPI-IO via Logistical Networking," *IEEE Parallel and Distributed Processing Symposium*, Rhodes Island, Greece, April 2006.
- Jason Zurawski, Martin Swany, Micah Beck and Ying Ding, "Logistical Multicast for Data

Distribution,” *Workshop on Grids and Advanced Networks*, Cardiff, UK , May, 2005.

- Huadong Liu, Micah Beck, Jian Huang, “Dynamic Co-Scheduling of Distributed Computation and Replication,” *IEEE International Symposium on Cluster Computing and the Grid*, Singapore, May 2006.
- Jonghyun Lee, Robert Ross, Scott Atchley, Micah Beck, Rajeev Thakur, “MPI-IO/L: Efficient Remote I/O for MPI-IO via Logistical Networking,” *IEEE Parallel and Distributed Processing Symposium*, Rhodes Island, Greece, April 2006.
- Jason Zurawski, Martin Swany , Micah Beck and Ying Ding,” Logistical Multicast for Data Distribution,” *Workshop on Grids and Advanced Networks*, Cardiff, UK , May, 2005.
- Viraj Bhat, Scott Klasky, Scott Atchley, Micah Beck, Doug McCune and Manish Parashar, “High Performance Threaded Data Streaming for Large Scale Simulations,” *5th IEEE/ACM International Workshop on Grid Computing*, Pittsburgh, PA, November, 2004.
- M. Beck, Y. Ding, T. Moore and J. Plank, “Transnet Architecture and Logistical Networking for Distributed Storage,” *Workshop on Scalable File System and Storage Technologies*, Sept, 2004.
- Micah Beck, Jean-Patrick Gelas, Dustin Parr, James S. Plank and Stephen Soltesz, “LoDN: Logistical Distribution Network ,” *Workshop on Advanced Collaborative Environments*, Nice, France, Sept, 2004.
- A. Bassi, M. Beck, F. Chanussot, J.P. Gelas, R. Harakay, L. Lefevre, T. Moore, J. Plank and P. Primet, “Active and Logistical Networking for Grid Computing: the e-Toile Architecture,” *Intl. Conf. on Computational Science*, Krakow, Poland, June, 2004.
- Jin Ding, Jian Huang, Micah Beck, Shaotao Liu, Terry Moore, and Stephen Soltesz, “Remote Visualization by Browsing Image Based Databases with Logistical Networking,” *SC 2003*, Phoenix, AZ, November 2003.
- Micah Beck, James S. Plank, Jeremy Millar, Scott Atchley, Stephen Soltesz, Alessandro Bassi , Huadong Liu, “Information Security on the Logistical Network: An End-to-End Approach”, *IEEE Security in Storage Workshop*, Washington, D.C., USA, October, 2003
- Micah Beck, Terry Moore and James S. Plank, “An End-to-End Approach to Globally Scalable Programmable Networking,” *FDNA-03: Workshop on Future Directions in Network Architecture, in conjunction with ACM SIGCOMM 2003*, Karlsruhe, Germany, August 2003.
- Micah Beck, Ying Ding, Erika Fuentes and Sharmila Kancherla, “An Exposed Approach to Reliable Multicast in Heterogeneous Logistical Networks,” *Workshop on Grids and Advanced Networks*, Tokyo, Japan, May 12-15, 2003.
- Alessandro Bassi, Micah Beck, Terry Moore, and James S. Plank, “The Logistical Backbone: Scalable Infrastructure for Global Data Grids,” *Asian Computing Science Conference 2002*, Hanoi, Vietnam, December 2002.
- Micah Beck, Terry Moore, and James S. Plank, “An End-to-End Approach to Globally Scalable Network Storage,” *ACM SIGCOMM 2002 Conference*, Pittsburgh, PA, August 19-23, 2002.
- Micah Beck and Terry Moore, “Toward a Scalable Architecture for Logistical Management of Active Content,” *Workshop on Distributed Computing Architectures for Digital Libraries*, Vancouver, Canada, August 18-21, 2002.

- Alessandro Bassi, Micah Beck, Jean Patrick Gelas and Laurent Lefevre, "Logistical Storage in Active Networking: a promising framework for network services," *3rd International Conference on Internet Computing (IC 2002)*, Las Vegas, NV, June 24-27, 2002.
- James S. Plank and Micah Beck, "The Logistical Computing Stack -- A Design For Wide-Area, Scalable, Uninterruptible Computing," *Workshop on Scalable, Uninterruptible Computing, DSN 2002: Dependable Systems and Networks*, Bethesda, Maryland, June 2002.
- Micah Beck and Terry Moore, "Logistical Networking: When Institutions Peer," *2nd International Workshop on Global and Peer-to-Peer Computing on Large Scale Distributed Systems, CCGrid 2002*, Berlin, Germany, May 21-24, 2002.
- Alessandro Bassi, Micah Beck, Graham Fagg, Terry Moore, James S. Plank, Martin Swamy, and Rich Wolski, "The Internet Backplane Protocol: A Study in Resource Sharing," *International Symposium on Cluster Computing and the Grid*, Berlin, Germany, May 2002.
- Alessandro Bassi, Micah Beck, Erika Fuentes, Terry Moore, and James S. Plank, "Logistical Storage Resources for the Grid," *International Conference on Computational Science*, Amsterdam, The Netherlands, April 21-24, 2002.
- Scott Atchley, Stephen Soltesz, James S. Plank, Micah Beck, and Terry Moore, "Fault-Tolerance in the Network Storage Stack," *IEEE Workshop on Fault-Tolerant Parallel and Distributed Systems*, Ft. Lauderdale, FL, April 15-19, 2002.
- James S. Plank, Micah Beck, and Terry Moore, "Logistical Networking Research and the Network Storage Stack," *USENIX FAST 2002 Conference on File and Storage Technologies, work in progress report*, Monterey, CA, January 28-30, 2002.
- Micah Beck, Terry Moore and James S. Plank, "Exposed vs. Encapsulated Approaches to Grid Service Architecture," *2nd International Workshop on Grid Computing*, Denver, CO, November, 2001.
- Micah Beck, Dorian Arnold, Alessandro Bassi, Jack Dongarra, Terence Moore, James S. Plank, Martin Swamy, Sathish Vadhiyar, Rich Wolski, Fran Berman, Henri Casanova, and Graziano Obertelli, "Logistical Computing and Internetworking: Middleware for the Use of Storage in Communication," *Third Annual International Workshop on Active Middleware Services (AMS 2001)*, San Francisco, CA, August 06, 2001.
- Alessandro Bassi, Micah Beck, and Terry Moore, "Mobile Management of Network Files," *Third Annual International Workshop on Active Middleware Services (AMS 2001)*, San Francisco, CA, August 06, 2001.
- James S. Plank, Micah Beck, Wael Elwasif, Terence Moore, Martin Swamy and Rich Wolski, "The Internet Backplane Protocol: Storage in the Network," *NetStore '99: Network Storage Symposium*, Internet2, Seattle, WA, October 1999.
- Wael Elwasif, James S. Plank, Micah Beck and Rich Wolski, "IBP-Mail: Controlled Delivery of Large Mail Files," *NetStore '99: Network Storage Symposium*, Internet2, Seattle, WA, October 1999.
- M. Beck, R. Chawla, B. Dempsey and T. Moore, "Portable Representation of Internet Content Channels in I2-DSI," *4th Intl WWW Caching Workshop*, San Diego, CA, May 1999.
- James S. Plank, Micah Beck, Gerry Kingsley and Kai Li, "Libckpt: Transparent Checkpointing under Unix," *Winter 1995 Technical Conference*, New Orleans, LA, January 1995.

1995, pp. 213--223.

- Keshav Pingali, Micah Beck, Richard Johnson, Mayan Moudgill, and Paul Stodghill, "Dependence Flow Graphs: An Algebraic Approach to Program Dependencies," *1991 Symposium on the Principles of Programming Languages*, Orlando, Florida, January 1991.

Other Papers

- Micah Beck, Huadong Liu, Terry Moore, Yong Zheng, "Pipelining and Caching the Internet Backplane Protocol," UT-CS-04-529, University of Tennessee Computer Science Department, September, 2004.
- Micah Beck, Terry Moore, "Locating Interoperability in the Network Stack," UT-CS-04-520, University of Tennessee Computer Science Department, February, 2004.
- Micah Beck, "Why Logistical Networking is not a Content Sharing Service," UT-CS-04-516, University of Tennessee Department of Computer Science, December, 2003.
- Scott Atchley, Micah Beck, Hunter Hagewood, Jeremy Millar, Terry Moore, James S. Plank, and Stephen Soltesz, "Next Generation Content Distribution Using the Logistical Networking Testbed," Technical Report CS-02-498, University of Tennessee Department of Computer Science, December 30, 2002.
- Scott Atchley, Micah Beck, Jeremy Millar, Terry Moore, James S. Plank, and Stephen Soltesz, "The Logistical Networking Testbed," Technical Report CS-02-496, University of Tennessee Department of Computer Science, December 16, 2002.
- Scott Atchley, Stephen Soltesz, James S. Plank, Micah Beck, "Video IBPster," Technical Report CS-02-490, University of Tennessee Department of Computer Science, October 31, 2002.
- James S. Plank, Scott Atchley, Ying Ding, and Micah Beck, "Algorithms for High Performance, Wide-Area, Distributed File Downloads," Technical Report CS-02-485, University of Tennessee Department of Computer Science, October 8, 2002.
- Micah Beck, Terry Moore and James S. Plank, "Scalable Sharing of Wide Area Storage Resources" Technical Report CS-02-475, University of Tennessee Department of Computer Science, January 2002.
- Micah Beck, James S. Plank, Terry Moore, "The Initial IBP Tech Report," Technical Report CS-98-407, University of Tennessee Department of Computer Science, November 1998.

Micah Beck: Research Funding

Federal Grants Currently Funded

- "Federated Archive Cyberinfrastructure Testbed", Library of Congress, \$149,000 (10/1/2007-10/1/2008), Principle Investigator.
- "Center for Edge Plasma Simulation," Department of Energy, \$180,000 (8/1/05-7/31/09), Principal Investigator.

- “Center for Gyrokinetic Particle Simulation of Turbulent Transport in Burning Plasmas,” Department of Energy, award #DE-FG02-04ER25651. \$119,844 (9/04-9/08), Principal Investigator.
- “A National Logistical Networking Testbed,” National Science Foundation, CISE Research Resources award #0224441. \$900K (11/02 to 11/08). Principal Investigator.

Federal Grants Previously Funded

- “Overlay Transit Networking for Scalable, High Performance Data Communications across Heterogeneous Infrastructure,” Department of Energy, SciDAC High Performance Networking. \$200,000 (9/04-9/06), Principal Investigator.
- “Active Logistical State Management for Distributed and Grid Application Environments,” National Science Foundation, Next Generation Software, \$587,083 (9/04-8/07), Co-Principal Investigator (PI Jian Huang).
- “EPSCoR National Workshop on Cyberinfrastructure,” National Science Foundation, EPSCoR Program, \$99,978, Co-Principal Investigator (PI George Garrison).
- “Planning a Globally Accessible Archive of MODIS Data,” National Science Foundation, IIS Digital Archives Program, award #0456017. \$99,357 (5/05 to 4/06). Principal Investigator.
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- “The Scalable Intracampus Research Grid for Computer Science Research,” National Science Foundation, CISE Research Infrastructure, award #9972889. \$1,968,088 (2/00 to 1/05). Co-Principal Investigator (PI Jack Dongarra).
- “Optimizing Performance and Reliability in Distributed Computing Systems Through Wide Spectrum Storage Services,” National Science Foundation, CISE Next Generation Software, award #0204007. \$549,163 (11/02 to 10/04). Co-Principal Investigator (PI James S. Plank).
- “Optimizing Performance and Enhancing Functionality of Distributed Applications Using Logistical Networking,” Department of Energy, SciDAC High Performance Networking, award #DE-FC02-01ER25465. \$1,455,282 (8/01 to 8/04). Principal Investigator.
- “GridSolve: A System for Grid-enabling General Purpose Problem Solving Environments,” National Science Foundation, CISE Network Centric Middleware, award #0222945. \$700,000 (7/02 to 6/04). Co-Principal Investigator (PI Jack Dongarra).
- “A Research Testbed for Services Based on Logistical Networking,” National Science Foundation, CISE Internet Technologies, award #9980203. \$998,799 (8/00 to 8/03). Principal Investigator.
- “Data Management and I/O for DoD Applications,” Department of Defence, PET. \$40,000. Co-Principal Investigator (David Cronk PI).
- “Next Generation Software: Logistical QoS through Application-Driven Scheduling of Remote Storage,” National Science Foundation, CISE Next Generation Software, award # 9975015. \$1,300,000 (8/99 to 8/02). Co-Principal Investigator (PI James S. Plank).
- “Optimizing Distributed Application Performance through Logistical Networking,”

Department of Energy, Next Generation Internet, award #DE-FC02-99ER25396. \$298,134 (7/99 to 7/00). Principal Investigator.

University of Tennessee Research Funding

Science Alliance Postdoctoral Researcher, \$100,000. Principal Investigator (2/04-4/05)
Center for Information Technology Research.