Joshua Hursey

IBM Location: Rochester, MN
Email: jhursey@us.ibm.com
Web: https://www.joshuahursey.com
LinkedIn: https://www.linkedin.com/in/joshuahursey/

Research and Development Interests

As a senior software engineer at IBM, I contribute to system software development for on-premises and cloud-based High Performance Computing (HPC) and Artificial Intelligence (AI) systems of all scales and lead a team of developers. My team is dedicated to building the end-to-end software stack that supports executing an AI model using multiple IBM Spyre AIU accelerators for distributed inference and other related tasks.

My work at IBM has involved deploying the ORNL Summit and LLNL Sierra 100+ PFlop pre-exascale HPC systems, where I focused on the Spectrum MPI and Job Step Manager (JSM) components of the HPC software stack. These large-scale systems have honed my skills and broadened my professional interests, which span AI and HPC libraries, cloud ecosystems, containerization, scheduler and runtime systems, scientific computing, and AI/DL/ML workflows.

Education

July 2010	Ph.D., Computer Science
	Indiana University, Bloomington, IN
	Dissertation: "Coordinated Checkpoint/Restart Process Fault Tolerance for MPI Applications on HPC Systems"
May 2006	M.S., Computer Science
	Indiana University, Bloomington, IN
May 2003	B.A., Computer Science, Mathematics Minor
	Earlham College, Richmond, IN

Professional Experience

Feb. 2016 - Present	**Senior Software Engineer**	IBM
		Rochester, MN

Lead a software engineering team dedicated to building the end-to-end software stack that supports executing an AI model using multiple IBM Spyre AIU accelerators for distributed inference. Lead developer of the Spectrum MPI, Open MPI, and PMIx for High Performance Computing (HPC) systems and applications. I worked on IBM's Spectrum MPI and Job Step Manager (JSM) parts of the software ecosystem for the CORAL pre-exascale supercomputers at LLNL (Sierra) and ORNL (Summit).

Aug. 2012 - Jan. 2016	**Assistant Professor**	University of Wisconsin-La Crosse
	Computer Science Department	La Crosse, WI

Teaching a wide range of courses to undergraduate and graduate computer science students. Advising undergraduate student independent study projects, and graduate student capstone projects. Conducting research with students. Academic and professional advising.

Aug. 2010 - July 2012	**Postdoctoral Research Associate**	Oak Ridge National Lab
	Mentors: Dr. Ricky Kendall, Dr. Richard Graham	Oak Ridge, TN

Conducted research into scalable High Performance Computing (HPC) application fault readiness and middleware support. Investigated process fault tolerance semantics and interfaces as part of the MPI Forum's Fault Tolerance Working Group. Lead the MPI Forum's Fault Tolerance Working Group. Prototyped various fault tolerance proposals with leadership HPC applications and the Open MPI project.

Jan. 2005 - July 2010	**Research Assistant**	Indiana University
	Advisor: Professor Andrew Lumsdaine	Bloomington, IN

Conducted research into scalable process fault tolerance techniques for High Performance Computing (HPC). Integrated these techniques into the Open MPI, and CIFTS FTB projects.

May 2009 - Aug. 2009	**Research Assistant**	Oak Ridge National Lab
	Advisor: Dr. Richard Graham	Oak Ridge, TN

Conducted research into scalable, resilient runtime environments for HPC. Contributed to the Open MPI and Scalable Tools Communication Infrastructure (STCI) projects.

June 2007 - Aug. 2007	**Research Assistant**	Oak Ridge National Lab
	Advisor: Dr. Richard Graham	Oak Ridge, TN

Integrated Cray Application Level Placement Scheduler (ALPS) support into the Open MPI project to support the Cray XT4/5 (Jaguar). Supported Open MPI development and deployment at ORNL. Contributed to the MPI Testing Tool (MTT) to support Cray environments, back-end database enhancements, and user interface improvements.

May 2006 - Aug. 2006	**Research Assistant**	Los Alamos National Lab
	Advisor: Dr. David Daniel	Los Alamos, NM

Conducted research into resilient runtime environments, and checkpoint/restart techniques for HPC. Designed and developed transparent, coordinated checkpoint/restart process fault tolerance for the Open MPI project.

May 2005 - Aug. 2005	**Research Assistant**	Lawrence Berkeley National Lab
	Advisor: Dr. Paul H. Hargrove	Berkeley, CA

Supported efforts to make the K42 operating system suitable for HPC. Conducted research into checkpoint/restart process fault tolerance for the Open MPI project.

Aug. 2004 - Dec. 2004	**Research Assistant**	Indiana University
	Advisor: Professor David Wise	Bloomington, IN

Conducted research into cache oblivious matrix multiplication algorithms on HPC clusters.

Aug. 2003 - Aug. 2004	**Research Assistant**	Earlham College
	Advisor: Professor Charles Peck	Richmond, IN

Designing and developing the Folding@Clusters distributed computing project. Developed methodologies for benchmarking and tuning interdependent scientific software packages on HPC clusters.

Nov. 2002 - May 2005	**Software Consultant**	Safe Passage Comm., Inc.
	Manager: Charles Peck	Richmond, IN

Designing and developing mobility applications for PDAs, cellular phones, Symbol scanners, and other wireless devices. Contributed to open source projects supporting these applications.

Jan. 2004 - June 2004	**Adjunct Instructor**	Purdue University
	CPT 267: Introduction to C++ Programming	Richmond, IN

Taught the C++ programming language.

| Aug. 2003 - Dec. 2003 | **Adjunct Instructor** | Earlham College |
| | CS 127: Programming and Problem Solving | Richmond, IN |

Used the C++ programming language.

| June 2002 - Aug. 2003 | **Research Assistant** | Earlham College |
| | Advisor: Professor Charles Peck | Richmond, IN |

Conducted research into software design and structure of molecular dynamics applications for Beowulf clusters.

| May 2003 - June 2003 | **Teaching Assistant, Co-Organizer** | Earlham College |
| | Service Learning Trip: Jamaica | Richmond, IN |

Service learning trip to Jamaica with 15 students and faculty members.

| Aug. 2002 - Dec. 2002 | **Senior Seminar Project** | Earlham College |
| | Advisor: Professor Jim Rogers | Richmond, IN |

Conducted research into fingerprint biometric recognition using artificial neural networks..

Publications

The* marker next to a name indicates an undergraduate student under my direction.

Patents

- **Joshua J. Hursey**, Austen William Lauria, William P. Lepera, Scott Miller, and Robert Perricone. Advisor service for network aware collective communication patterns, U.S. Patent P202200992US01 (filed), June 2023.

- **Joshua J. Hursey**, David Solt, Geoff Paulsen, Thomas Gooding, and William Morrison. Considering differences of software images during software image distribution using patches, U.S. Patent P202106433US01 (filed), Apr. 2023.

- **Joshua J. Hursey**, Austen William Lauria, William P. Lepera, Scott Miller, and Robert Perricone. Broadcast and scatter communication operations, U.S. Patent US11711425B1, Oct. 2022.

- **Joshua J. Hursey**, David Solt, and Austen William Lauria. A surrogate process creation technique for high process-per-server scenarios, U.S. Patent 20220283877, March 2021.

- Dahai Guo, David G. Solt, **Joshua J. Hursey**, Austen William Lauria, and Xin Guo. Explicit resource file to assign exact resources to job ranks, U.S. Patent 20210182070, Dec. 2019.

Journals

- David Solt, **Joshua J. Hursey**, Austen Lauria, Dahai Guo, and Xin Guo. Scalable, fault-tolerant job step management for high-performance systems. *IBM Journal of Research and Development*, 64(3/4):8:1–8:9, 2020.

- Pratul K. Agarwal, Thomas Naughton, Byung H. Park, David E. Bernholdt, **Joshua J. Hursey**, and Al Geist. Application health monitoring for extreme-scale resiliency using cooperative fault management. *Concurrency and Computation: Practice and Experience*, 32(2):e5449, 2020. e5449 CPE-18-1561.R1.

- Ralph H. Castain, **Joshua Hursey**, Aurelien Bouteiller, and David Solt. PMIx: Process management for exascale environments. *Parallel Computing*, 79:9–29, 2018.

- Wesley Bland, Aurelien Bouteiller, Thomas Herault, **Joshua Hursey**, George Bosilca, and Jack J. Dongarra. An evaluation of user-level failure mitigation support in MPI. *Computing: Special Edition on EuroMPI 2012*, 2013.

- **Joshua Hursey** and Richard Graham. Analyzing fault aware collective performance in a process fault tolerant MPI. *Parallel Computing*, 2012.

- Alex Breuer, **Joshua J. Hursey**, Tonya Stroman, and Arvind Verma. Visualization of criminal activity in an urban population. *Artificial Crime Analysis Systems: Using Computer Simulations and Geographic Information Systems*, January 2008.

Conferences and Workshops

- **Joshua Hursey**. A separated model for running rootless, unprivileged PMIx-enabled HPC applications in Kubernetes. In *2022 IEEE/ACM 4th International Workshop on Containers and New Orchestration Paradigms for Isolated Environments in HPC (CANOPIE-HPC)*, pages 36–44, 2022.

- George Chochia, David Solt, and **Joshua Hursey**. Applying on node aggregation methods to MPI alltoall collectives: Matrix block aggregation algorithm. In *Proceedings of the 29th European MPI Users' Group Meeting*, EuroMPI/USA'22, pages 11–17, New York, NY, USA, 2022. Association for Computing Machinery.

- **Joshua Hursey**. Design considerations for building and running containerized MPI applications. In *2020 2nd International Workshop on Containers and New Orchestration Paradigms for Isolated Environments in HPC (CANOPIE-HPC)*, pages 35–44, 2020.

- **Joshua Hursey** and Scott Miller. Running InfiniBand and GPU accelerated MPI applications in a Kubernetes environment. In *SC'19 Workshop on Containers and New Orchestration Paradigms for Isolated Environments in HPC (CANOPIE-HPC)*, CANOPIE-HPC, 2019.

- Ralph H. Castain, David Solt, **Joshua Hursey**, and Aurelien Bouteiller. PMIx: Process management for exascale environments. In *Proceedings of the 24th European MPI Users' Group Meeting*, EuroMPI '17, New York, NY, USA, 2017. Association for Computing Machinery.

- Samantha S. Foley and **Joshua Hursey**. OnRamp to parallel and distributed computing. In *EduHPC-15: Workshop on Education for High-Performance Computing held in conjunction with SC-15: The International Conference on High Performance Computing, Networking, Storage, and Analysis*, November 2015.

- Brice Goglin, **Joshua Hursey**, and Jeffrey M. Squyres. netloc: Towards a comprehensive view of the HPC system topology. In *Fifth International Workshop on Parallel Software Tools and Tool Infrastructures (PSTI 2014) held in conjunction with the International Conference on Parallel Processing Workshops (ICCPW)*, pages 216–225, Minneapolis, United States, September 2014. IEEE.

- **Joshua Hursey** and Jeffrey M. Squyres. Advancing application process affinity experimentation: Open MPI's LAMA-based affinity interface. In *IMUDI 2013: Special Session on Improving MPI User And Developer Interaction held in conjunction with EuroMPI 2013*, September 2013.

- Wesley Bland, Aurelien Bouteiller, Thomas Herault, **Joshua Hursey**, George Bosilca, and Jack J. Dongarra. An evaluation of user-level failure mitigation support in MPI. In *EuroMPI 2012: Proceedings of the 19th EuroMPI Conference*, September 2012.

- Richard L. Graham, **Joshua Hursey**, Geoffroy Vallee, Thomas Naughton, and Swen Boehm. The impact of a fault tolerant MPI on scalable systems services and applications. In *CUG 2012: Cray Users Group*, Stuttgart, Germany, April 2012.

- **Joshua Hursey**, Thomas Naughton, Geoffroy Vallee, and Richard L. Graham. A log-scaling fault tolerant agreement algorithm for a fault tolerant MPI. In *EuroMPI 2011: Proceedings of the 18th EuroMPI Conference*, Santorini, Greece, September 2011.

- **Joshua Hursey** and Richard Graham. Building a fault tolerant MPI application: A ring communication example. In *16th International Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS) held in conjunction with the 25th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, Anchorage, Alaska, May 2011.

- **Joshua Hursey** and Richard Graham. Preserving collective performance across process failure for a fault tolerant MPI. In *16th International Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS) held in conjunction with the 25th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, Anchorage, Alaska, May 2011.

- **Joshua Hursey**, Chris January, Mark O'Connor, Paul H. Hargrove, David Lecomber, Jeffrey M. Squyres, and Andrew Lumsdaine. Checkpoint/restart-enabled parallel debugging. *Proceedings of the European MPI Users Group Conference (EuroMPI)*, September 2010.

- **Joshua Hursey**, Timothy I. Mattox, and Andrew Lumsdaine. Interconnect agnostic checkpoint/restart in Open MPI. In *Proceedings of the 18th ACM International Symposium on High Performance Distributed Computing (HPDC 2009)*, June 2009.

- Joseph A. Cottam, Andrew Lumsdaine, and **Joshua Hursey**. Representing unit test data for large scale software development. In *ACM Sypmposium on Software Visualization (SoftVis 2008)*, September 2008.

- **Joshua Hursey**, Ethan Mallove, Jeffrey M. Squyres, and Andrew Lumsdaine. An extensible framework for distributed testing of MPI implementations. In *Proceedings of the 14th European PVM/MPI Conference*, October 2007.

- Yvonne Rogers, Kay Connelly, Lenore Tedesco, William Hazlewood, Andrew Kurtz, Robert E. Hall, **Joshua Hursey**, and Tammy Toscos. Why it's worth the hassle: The value of in-situ studies when designing Ubicomp. In *UbiComp 2007: Ubiquitous Computing*, September 2007. Nominated for the Best Paper Award.

- **Joshua Hursey**, Jeffrey M. Squyres, Timothy I. Mattox, and Andrew Lumsdaine. The design and implementation of checkpoint/restart process fault tolerance for Open MPI. In *12th International Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS) held in conjunction with the 21th IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, March 2007.

- David S. Wise, Craig Citro, **Joshua Hursey**, Fang Liu, and Michael Rainey. A paradigm for parallel matrix algorithms: Scalable Cholesky. In *Proceedings of the 11th International Euro-Par Conference*, August 2005.

Technical Reports

- **Joshua Hursey** and Andrew Lumsdaine. A composable runtime recovery policy framework supporting resilient HPC applications. Technical Report TR686, Indiana University, Bloomington, Indiana, USA, August 2010.

- **Joshua Hursey**, Jeffrey M. Squyres, and Andrew Lumsdaine. A checkpoint and restart service specification for Open MPI. Technical Report TR635, Indiana University, Bloomington, Indiana, USA, July 2006.

- Craig Shue, **Joshua Hursey**, and Arun Chauhan. MPI over scripting languages: Usability and performance tradeoffs. Technical Report TR631, Indiana University, Bloomington, Indiana, USA, February 2006.

Posters

- Artem Y. Polyakov, Boris I. Karasev, **Joshua Hursey**, Joshua Ladd, Mikhail Brinskii, and Elena Shipunova. A performance analysis and optimization of PMIx-based HPC software stacks. In *Proceedings of the 26th European MPI Users' Group Meeting*, EuroMPI '19, New York, NY, USA, 2019. Association for Computing Machinery.

- **Joshua Hursey**. High Performance Computing with containerized MPI applications: Use cases, challenges, and opportunities for innovation. In *IBM TVC Networking Poster Session*, 2019.

- Douglas MacFarland* and **Joshua Hursey**. Discovering network topologies in HPC systems. In *MICS 2013: Midwest Instruction and Computing Symposium*, La Crosse, WI, April 2013.

- **Joshua Hursey**, Jeffrey M. Squyres, and Terry Dontje. Locality-aware parallel process mapping for multi-core HPC systems. In *IEEE International Conference on Cluster Computing*, Austin, TX, September 2011.

- **Joshua Hursey**, Richard L. Graham, Greg Bronevetsky, Darius Buntinas, Howard Pritchard, and David G. Solt. Run-through stabilization: An MPI proposal for process fault tolerance. In *EuroMPI 2011: Proceedings of the 18th EuroMPI Conference*, Santorini, Greece, September 2011.

- **Joshua Hursey**, Scott Hampton, Pratul Agarwal, and Andrew Lumsdaine. An adaptive checkpoint/restart library for large scale HPC applications. In *SIAM Conference on Parallel Processing and Scientific Computing (PP10)*, February 2010.

- Ralph Castain, **Joshua Hursey**, Timothy I. Mattox, Chase Cotton, Robert M. Broberg, and Jonathan M. Smith. A resilient runtime environment for HPC and internet core router systems. In *IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC09)*, November 2009.

- Joseph A. Cottam, **Joshua Hursey**, and Andrew Lumsdaine. SeeTest: Unit test visualization. In *IEEE Symposium on Information Visualization (InfoVis 2008)*, November 2008.

- Joseph A. Cottam, **Joshua Hursey**, and Andrew Lumsdaine. SeeTest: Unit test visualization. Indiana University Computer Science and Informatics Graduate Research Poster Session, May 2008. Recieved honorable mention award.

- **Joshua Hursey**, Jeffrey M. Squyres, Timothy I. Mattox, and Andrew Lumsdaine. The design and implementation of checkpoint/restart process fault tolerance for Open MPI. Indiana University Computer Science and Informatics Graduate Research Poster Session, March 2007.

- Charles Peck, **Joshua Hursey**, Joshua McCoy, and John Schaefer. Calculating 1/sqrt(x) for molecular dynamics packages on commodity vector architectures. SIAM Conference on Computational Science and Engineering, February 2005.

- Charles Peck, **Joshua Hursey**, Joshua McCoy, and John Schaefer. Folding@Clusters: Harnessing grid-based parallel computing resources for molecular dynamics simulations. SIAM Conference on Computational Science and Engineering, February 2005.

- Charles Peck, **Joshua Hursey**, and Joshua McCoy. Benchmarking and tuning the GROMACS molecular dynamics package on beowulf clusters. SIAM Conference on Parallel Processing for Scientific Computing, February 2004. Received Best Poster Award.

- Charles Peck, **Joshua Hursey**, and Joshua McCoy. Benchmarking and tuning the GROMACS molecular dynamics package on beowulf clusters. Earlham College Undergraduate Research Conference, November 2003.

- **Joshua Hursey**. Fingerprint minutiae classification: A multi-layer feed-forward artificial neural network approach. Butler University's 14th Annual Undergraduate Research Conference, April 2003.

Other Publications

- **Joshua Hursey**, Thomas Naughton, Ralph Castain, and Aurelien Bouteiller. SC'22 BOF: Charting the PMIx roadmap, November 2022.

- Kathryn Mohror, Thomas Naughton, and **Joshua Hursey**. SC'21 BOF: Updates and roadmap for the PMIx community. ECP COMMUNITY BOF DAYS, March 2021.

- Ralph Castain, **Joshua Hursey**, and Kathryn Mohror. SC'19 BOF: Charting the PMIx roadmap, November 2019.

- Ralph Castain and **Joshua Hursey**. SC'18 BOF: PMIx: Enabling workflow orchestration, November 2018.

- Charles Peck, **Joshua Hursey**, Josh McCoy, and Vijay Pande. Building internet distributed computing systems. *Dr. Dobb's Journal*, November 2005.

Invited Talks

- **Joshua Hursey**. A separated model for running rootless, unprivileged PMIx-enabled HPC applications in Kubernetes. PMIx Standard Administrative Steering Committee (ASC) 1Q 2023 Meeting, January 2023.

- **Joshua Hursey**. Runtime requirements for MPI/PMI(x). Annual High Performance Container Workshop at ISC, June 2022.

- **Joshua Hursey**. Deep dive into PMI(x). Annual High Performance Container Workshop at ISC, June 2022.

- **Joshua Hursey**. Role of PMIx with containers in HPC environments. PMIx Standard Administrative Steering Committee (ASC) 2Q 2021 Meeting, May 2021.

- **Joshua Hursey**. Key-Value exchange modes: Put/Commit/Fence/Get semantics. PMIx Standard Administrative Steering Committee (ASC) 3Q 2020 Meeting, July 2020.

- **Joshua Hursey**. MPI and PMIx. Annual High Performance Container Workshop at ISC, June 2020.

- Jeffrey M. Squyres, Brian Barrett, and **Joshua Hursey**. A Career Panel Discussion of High Performance Computing Practitioners. Wake Forest University, April 2020.

- **Joshua Hursey**. Spectrum MPI. SC'19 BOF: Open MPI State of the Union, November 2019.

- **Joshua Hursey**. Spectrum MPI Update. HPCXXL Meeting, September 2019.

- **Joshua Hursey**. JSM and PMIx. HPCXXL Meeting, September 2019.

- **Joshua Hursey**. Spectrum MPI. SC'18 BOF: Open MPI State of the Union, November 2018.

- **Joshua Hursey**. Spectrum MPI and JSM. HPCXXL Meeting, September 2018.

- **Joshua Hursey**. Spectrum MPI. SC'17 BOF: Open MPI State of the Union, November 2017.

- **Joshua Hursey**. Spectrum MPI. HPCXXL Meeting, September 2017.

- **Joshua Hursey**. OnRamp: An interactive learning portal for parallel computing environments. CSinParallel Regional CS Educators Workshop, August 2015.

- **Joshua Hursey**. netloc: Towards a comprehensive view of the HPC system topology. UW-L Faculty Research Day, January 2014.

- Samantha Foley and **Joshua Hursey**. Saving the world through supercomputing: What it is like to work at Oak Ridge National Laboratory. Western Technical College Scholarship Seminar, November 2012.

- **Joshua Hursey** and Manju Gorentla Venkata. A preview of MPI 3.0: The shape of things to come. Oak Ridge National Laboratory CSMD Seminar Series, June 2012.

- **Joshua Hursey**. The impact of a fault tolerant MPI on scalable systems services and applications. Oak Ridge National Laboratory CCSD Seminar Series, May 2012.

- **Joshua Hursey**. Run-Through Stabilization: A step towards a process fault tolerant MPI standard. Los Alamos National Laboratory, October 2011.

- **Joshua Hursey**. Run-Through Stabilization: A step towards a process fault tolerant MPI standard. Sandia National Laboratory, October 2011.

- **Joshua Hursey**. Fault Tolerance Working Group ticket #276: Run-Through Stabilization Process Fault Tolerance. MPI Forum Plenary Session, July 2011. `https://svn.mpi-forum.org/trac/mpi-forum-web/ticket/276`.

- **Joshua Hursey**. Building a fault tolerant MPI standard. Oak Ridge National Laboratory CSMD Brown Bag Speaker Series, February 2011.

- **Joshua Hursey**. A fault tolerant MPI standard for HPC applications and libraries. Cisco Systems, Inc. Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC10), November 2010.

- **Joshua Hursey**, Jeffrey M. Squyres, Abhishek Kulkarni, and Andrew Lumsdaine. Open MPI tutorial. Indiana University Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC09), November 2009.

- **Joshua Hursey**. A transparent process migration framework for Open MPI. Cisco Systems, Inc. Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC09), November 2009.

- **Joshua Hursey**. Fault tolerance in Open MPI. Los Alamos National Laboratory Resilience Seminar, November 2009.

- **Joshua Hursey**. Fault tolerance in High Performance Computing: MPI and checkpoint/restart. Indiana University Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC08), November 2008.

- **Joshua Hursey**. MPI implementation health assessment through multi-institutional distributed testing. Cisco Systems, Inc. Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC08), November 2008.

- **Joshua Hursey**. Checkpoint/restart support in Open MPI. Sun Microsystems, Inc. Technical Talk Series, May 2008.

- **Joshua Hursey**. Process fault tolerance and Open MPI. Oak Ridge National Laboratory, June 2007.

- **Joshua Hursey**. Process fault tolerance in Open MPI. Innovative Computing Laboratory (ICL) Friday Lunch Speaker Series, University of Tennessee, Knoxville, February 2007.

- **Joshua Hursey**. Dealing with disaster: Fault tolerance in Open MPI. Indiana University Booth at IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC06), November 2006.

- **Joshua Hursey**. Fault tolerance and MPI. Los Alamos National Laboratory CCS1 Brown Bag Speaker Series, July 2006.

Grants Funded

(Co-)Principal Investigator

2015-16   ACM SIGCSE Special Projects Grant, $3,777.
*PI: Samantha Foley and **Joshua Hursey***
"OnRamp: An Interactive Learning Portal for Parallel Computing Environments"

2015   UWL Faculty/Staff Grant Development Program, $3,000.
*PI: Samantha Foley and **Joshua Hursey***
"OnRamp: An Interactive Learning Portal for Parallel Computing Environments"

2014-15   UWL Community Partnerships Incentive Grant (CPIG), $2,000.
*PI: **Joshua Hursey** and Kasi Periyasamy*
"Software development to support Habitat for Humanity"

2013-14   University of Wisconsin-La Crosse Faculty Research Grant, $7,160.
*PI: **Joshua Hursey***
"A Portable Network Locality Service for High Performance Computing Systems"

Equipment

2013   Cisco Systems, Inc.
*PI: **Joshua Hursey***
Servers, and switches to support networking research.

Selected Honors and Awards

- IBM Outstanding Technical Achievement Award ("Unite to get it done now"), IBM, April 2019.

- IBM Manager's Choice Award ("Put the client first"), IBM, Nov. 2018.

- IBM Manager's Choice Award ("Unite to get it done now"), IBM, June 2018.

- IBM Manager's Choice Award ("Put the client first"), IBM, June 2018.

- IBM Manager's Choice Award ("Put the client first"), IBM, June 2017.

- Nomination, Provost's Teaching Excellence Award, University of Wisconsin-La Crosse, 2013.

- Nomination, Most Accessible Award from Students Advocating Potential Ability (SAPA), University of Wisconsin-La Crosse, 2013.

- Honorable Mention, Computer Science and Informatics Graduate Research Symposium, Indiana University, 2008.

- Nominated for Best Paper Award, UbiComp 2007: Ubiquitous Computing, 2007.

- Best Poster Award, SIAM Conference on Parallel Processing for Scientific Computing, 2004.

- Academic and Departmental Honors Degree, Earlham College, 2003.

- Bonner Foundation Scholarship, Earlham College, 1999-2003.

Teaching Experience

University of Wisconsin-La Crosse (La Crosse, WI)

Fall 2015   **CS 220: Software Design II**
Fall 2015   **CS 340: Software Design III: Abstract Data Types**
Fall 2015   **CS 441/541: Operating System Concepts**

Spring 2014	**CS 120: Software Design I** (*two sections*)
Spring 2014	**CS 441/541: Operating System Concepts**
Fall 2014	**CS 120: Software Design I** (*two sections*)
Fall 2014	**CS 441/541: Operating System Concepts**
Spring 2014	**CS 220: Software Design II**
Spring 2014	**CS 224: Introduction to the C Programming Language**
Spring 2014	**CS 441/541: Operating System Concepts**
Fall 2013	**CS 120: Software Design I**
Fall 2013	**CS 220: Software Design II**
Fall 2013	**CS 441/541: Operating System Concepts**
Spring 2013	**CS 120: Software Design I**
Spring 2013	**CS 342: Software Testing Techniques**
Spring 2013	**CS 441/541: Operating System Concepts**
Fall 2012	**CS 120: Software Design I**
Fall 2012	**CS 441/541: Operating System Concepts**

Indiana University (Bloomington, IN)

Fall 2008	**P436: Introduction to Operating Systems** (*Primary Instructor*)

Purdue University (Richmond, IN)

Spring 2004	**CPT 267: Introduction to C++ Programming** (*Adjunct Instructor*)

Earlham College (Richmond, IN)

Fall 2003	**CS 127: Programming and Problem Solving** (*Adjunct Instructor*)
Summer 2003	**Service Learning Trip: Jamaica** (*Teaching Assistant, Co-Organizer*)

Service

Professional

- Co-Chair PMIx Standard 2019-2024

- Played a central role in establishing the PMIx Standardization Body and the PMIx Administrative Steering Committee (ASC) in 2018.

- **Program Committee Member (and Reviewer):**
  High Performance Container Workshop at ISC, 2020-2022;
  High Performance Computing (HPC) Symposium, 2012 – 2014;
  Workshop on High-Level Parallel Programming Models and Supportive Environments (HIPS), 2013;
  Workshop on Dependability and Fault Tolerance (VERFE), 2012;
  EuroMPI Users' Group Conference, 2010, 2011;
  Software-Controlled, Adaptive Fault-Tolerance in Microprocessors Workshop (SCAFT), 2011.

- **Reviewer:**
  IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2020-2021;
  Platform for Advanced Scientific Computing (PASC) Conference, 2019;
  ACM/IEEE The International Conference for High Performance Computing, Networking, Storage, and Analysis Workshop, 2018;
  ACM Special Interest Group on Computer Science Education (SIGCSE) Conference, 2015, 2016;

International Journal of High Performance Computing, Sage Publications, 2014;
The Computer Journal, Oxford University Press, 2014, 2017;
Wiley Journal of Concurrency and Computation: Practice and Experience, 2007, 2013;
Midwest Instruction and Computing Symposium, 2013;
National Conference on Undergraduate Research (NCUR), 2013;
IEEE Transactions on Parallel and Distributed Systems, 2008, 2012;
Wiley Journal of Software: Practice and Experience, 2011;
Elsevier Journal of Parallel and Distributed Computing, 2007, 2010, 2011;
IEEE International Conference on e-Science and Grid Computing, 2007;
IEEE International Symposium on Cluster Computing and the Grid (CCGrid), 2007.

- **Session Chair:**
  Midwest Instruction and Computing Symposium, 2013;
  IEEE Workshop on Dependable Parallel, Distributed and Network-Centric Systems (DPDNS), 2011;
  IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2011.

- XSEDE Campus Champion, Aug. 2015 – Jan. 2016.

University of Wisconsin-La Crosse

- **Chair**, Faculty Senate Undergraduate Research Committee, 2015-2016.

- **Committee Member**, College of Science and Health Dean's Distinguished Fellowship, 2015-2016.

- **Committee Member**, Faculty Senate Undergraduate Research Committee, 2013-2014, 2014-2015.

- **Organizer**, Undergraduate Research Committee panel on "Mentoring Undergraduate Research and Grant Writing", Oct. 2014.

- **Reviewer**, UW-L Foundation Scholarships, March 2015.

- **Panelist**, Undergraduate Research Committee panel on "Mentoring Undergraduate Research: Panel and Q&A Regarding Student Recruitment, Undergraduate Grant Preparation, and Optimizing Dual Productivity between Students and Mentors", Aug. 2014.

- **Session Moderator**, UW-L Celebration of Student Research & Creativity, April 2014.

- **Reviewer**, UW-L Foundation (Storlie Scholarship), April 2014.

University of Wisconsin-La Crosse Computer Science Department

- **Chair**, Computer Science Department Research Committee, 2015–2016.

- **Committee Member**, Computer Science Department Research Committee, 2013-2014, 2014-2015.

- **Committee Member**, Computer Science Search and Screen Committee, 2012, 2014, 2015.

- **Organizer**, Computer Science Faculty Lightning Talks Event, Oct. 2014.

- **Convener**, Computer Science Department Curriculum Roundtable, Feb. 2013.

- **Organizer**, Computer Science Faculty Lightning Talks Event, Oct. 2013.

- **Organizer**, Computer Science Faculty Lightning Talks Event, Feb. 2013.

Master of Software Engineering (MSE) Capstone Projects

- **Co-Advisor**, Han Chen, Dec. 2014 - Dec. 2015.
  Title: "MTT Client Configuration Editor"

- **Examination Committee Member**, Andrew Backes, Oct. 2015.
  Title: "A Message Routing System"

- **Examination Committee Member**, Sanhu Li, Aug. 2015.
  Title: "A Student Attendance Application"

- **Examination Committee Member**, Rui Li, Yufan Xue, May 2015.
  Title: "Twiddler: A Cloud-Based System for Managing Student Learning Outcomes"

- **Examination Committee Member**, Jenny Gijo, July 2014.
  Title: "A Tool for Use-Case Based Requirements Engineering"

- **Examination Committee Member**, Prathyusha Papanna, May 2014.
  Title: "A Tool for Automated Schema Matching"

- **Examination Committee Member**, Che-Ning Lin, Feb. 2014.
  Title: "A Face Recognition Application"

- **Examination Committee Member**, Shaker Elsabbagh, Aug. 2013.
  Title: "A Quality Control System for Westby Creamery"

- **Examination Committee Member**, Kyle Kamperschroer, June 2013.
  Title: "A Recipe Parsing Engine"

Indiana University Computer Science Department

- **Moderator**, Academic Survival Graduate Student Colloquia Series (ASGSC) (a series of 17 research and professional development events for graduate students including student research presentations, panels, training activities, a poster session, and a faculty lighting talks event), 2008-2009.

  – Organizer, Faculty Lightning Talks event involving 18 faculty members, Jan. 2009.
  – Organizer, Tools of the Trade: Introduction to LaTeXand BibTex, Feb. 2009.

- **Coordinator**, Kill-the-Week Social Hour, Computer Science Graduate Student Association, 2005 - 2007.

Community Outreach

- **Reviewer**, Annual Regional Middle School Science & Math Expo at UWL, 2015.

- **Teaching Assistant**, Girls in Science and Boys Exploration Camp at UWL, 2013.

- **Co-Organizer**, MICS Programming Competition, 2013.

- **Judge**, ACM Programming Competition – North Central – North America Regional, 2012.

- **Science Judge**, US Department of Energy Tennessee Science Bowl, 2011.

Directed Student Research Activities

Undergraduate student indicated by the[*] marker.

- Sept. 2014 – Dec. 2015: **Thomas Lynch**[*], "MPI/Middleware Testing Tool Modernization Project". *Student received UW-L Undergraduate Research & Creativity Grant for Spring 2014.*

- June – Aug. 2013: **Nicholas Buroker**[*], "Network Topology Discovery Project".

- Feb. – May 2013: **Douglas MacFarland**[*], "Network Topology Discovery Project".

Professional Affiliations

- Association for Computing Machinery (ACM) (2003 - Present)

    - SIGCSE
    - SIGHPC

- Institute of Electrical and Electronics Engineers (IEEE) (2008 - Present)