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Research Director at the University of Tennessee

Aurélien Bouteiller

Education

Ph.D. in Computer Science

- 2002-2006 • Ph.D. – Université de Paris-Sud XI
“Checkpoint and Rollback based Automatic Fault Tolerance in High Performance Message Passing Systems”.
Directed by Franck Cappello (INRIA Senior Research scientist).
Laboratoire de Recherche en Informatique (LRI) – Clusters & Grids Team.
INRIA Futurs – Grand-Large Team.
- 2001-2002 • Distributed Computer Science M.S. – Université de Paris-Sud XI – ranked 4th.
- 1997-2001 • Computer Science B.S. – Université de Rouen – ranked 2nd.

Positions Held

- since 2017 • Research Director, at the University of Tennessee (USA).
- since 2009 • Research Scientist, at the University of Tennessee (USA).
- 2006-2009 • Research Associate, at the University of Tennessee (USA).
- 2005-2006 • Adjunct Assistant Professor, at the École Normale Supérieure (ENS) Lyon (France).
- 2002-2006 • Research Assistant, at the Paris-Sud XI University (France).
- 2002-2006 • Teaching Assistant, at the Paris-Sud XI Orsay institute of technology (France).
- 2002 • Teaching Assistant, at the Rouen University (France).

Research Output

Awards

- **co-PI:** NSF EVOLVE - *Collaborative Research: SI2-SSI: EVOLVE: Enhancing the Open MPI Software for Next Generation Architectures and Applications*, Award #OAC-1664142, \$1,566,215, 06/01/2017 - 05/31/2021
- **co-PI:** ECP-DTE - *Distributed Tasking for Exascale*, Subcontract #UT-B-4000151974 under DOE Prime contract #DE-AC05-00OR22725, \$1,854,540, 12/14/2016 - 09/30/2022
- **Senior personnel:** ECP-OMPIx - *OpenMPI for Exascale*, Subcontract #UT-B-4000153505 under DOE Prime contract #DE-AC05-00OR22725, \$513,090, 02/27/2017 - 09/30/2022
- **senior personnel:** NSF ADAPT - *SI2-SSE: Collaborative Research: ADAPT: Next Generation MPI Library - Open MPI*, Award #OAC-1339820, \$347,216, 09/01/2013 - 08/31/2016
- **Best paper nominee:** SC16 The International Conference for High Performance Computing, Networking, Storage and Analysis (Supercomputing 2016)
- **Best paper award:** 28th IEEE International Parallel & Distributed Processing Symposium (IPDPS 2012)
- **Distinguished paper award:** 18th International European Conference on Parallel and Distributed Computing (Euro-Par 2012)
- **Distinguished paper award:** 17th International European Conference on Parallel and Distributed Computing (Euro-Par 2011)

Research Output (continued)

Tutorials & Invited Talks & Panels

- George Bosilca, **Aurelien Bouteiller**, Thomas Herault, Yves Robert, *Tutorial: Fault-tolerance for HPC: Theory and Practice*. SC'14, SC'15, SC'16, SC'17, SC'18, SC'19, SC'20
- **Aurelien Bouteiller**, Thomas Herault, George Bosilca, *Tutorial: Integrating PaRSEC Dataflow in your Application*. Exascale Computing Project Annual Meeting (ECP'20)
- Thomas Herault, **Aurelien Bouteiller**, *Advanced Programming on Hybrid Computers in PaRSEC Using Symbolic Representation*. Exascale Computing Project Annual Meeting (ECP'19)
- **Aurelien Bouteiller**, George Bosilca. *Tutorial: Resilient applications using MPI-level constructs*. EuroMPI 2014
- **Aurelien Bouteiller**, Piotr Luszczek. *Tutorial: DLA on Multicore with Accelerators*. ICS 2013
ent *Invited Talk: Failure Detection and Monitoring with PMIx/PRRTE*. PMIx Administrative Steering Committee Meeting 2020
- *Invited talk: Plan B: Interruption of Ongoing MPI Operations to Support Failure Recovery*. 11th Scheduling for Large Scale Systems Workshop (2016)
- *Invited talk: Enabling the production deployment of advanced Fault Tolerance techniques: Fault Tolerant MPI*. Dagstuhl Seminar 13381: Algorithms and Scheduling Techniques for Exascale Systems (2013)
- *Invited talk: Fault Tolerance Techniques for MPI programs*. 7th Scheduling for Large Scale Systems Workshop (2012)
- *Invited talk: Options and Challenges for Fault Tolerance*. Clusters, Clouds, and Data for Scientific Computing, CCDSC 2012

- **Aurelien Bouteiller**

- **Aurelien Bouteiller**, Romain Cledat, Javier Conejero, Elisabeth Larsson, Samuel Thibault, Albert-Jan N. Yzelman, Chair: Rosa M. Badia *Panel: What Do You Need to Know About Task-Based Programming for Future Systems?* SIAM Parallel Processing (2016)
- P. Beckman, D. Bernholdt, **A. Bouteiller**, A. Lumsdaine, P. Hargrove and D.K. Panda *Birds-of-feather talk on CIFTS : Coordinated Fault Tolerance for High Performance Computing*. SC'07, SC'08, SC'09, SC'10

Book Chapters

- **Aurelien Bouteiller**: *Fault Tolerant MPI*. Fault-Tolerance Techniques for High-Performance Computing, pp. 145–229, doi:10.1007/978-3-329-20943-2, Springer, 2015
- George Bosilca, **Aurelien Bouteiller**, Anthony Danalis, Thomas Herault, Piotr Luszczek, Jack J. Dongarra. *Dense Linear Algebra on Distributed Heterogeneous Hardware with a Symbolic DAG Approach*. Scalable Computing and Communications: Theory and Practice, 2012
- George Bosilca, **Aurelien Bouteiller**, Anthony Danalis, Thomas Héroult, Jakub Kurzak, Piotr Luszczek, Stanimire Tomov, Jack J. Dongarra: *Scalable Dense Linear Algebra on Heterogeneous Hardware*. Advances in Parallel Computing 24(2), doi: 10.3233/978-1-61499-324-7-65, pp. 65-103, 2012

International Journal Publications

- Nuria Losada, Patricia González, María J. Martín, George Bosilca, **Aurélien Bouteiller**, Keita Teranishi: *Fault tolerance of MPI applications in Exascale systems: The ULFM solution*. Future Gener. Comput. Syst. (FGCS) 106: 467-481 (2020)
- Atsushi Hori, Kazumi Yoshinaga, Thomas Héroult, **Aurelien Bouteiller**, George Bosilca, Yutaka Ishikawa: *Overhead of using spare nodes*. Int. J. High Perform. Comput. Appl. (IJHPCA) 34(2) (2020)
- Nuria Losada, George Bosilca, **Aurelien Bouteiller**, Patricia González, María J. Martín: *Local rollback for resilient MPI applications with application-level checkpointing and message logging*. Future Generation Comp. Syst. 91: 450-464 (2019)
- Valentin Le Fèvre, Thomas Héroult, Yves Robert, **Aurélien Bouteiller**, Atsushi Hori, George Bosilca, Jack J. Dongarra: *Comparing the performance of rigid, moldable and grid-shaped applications on failure-prone HPC platforms*. Parallel Comput. 85: 1-12 (2019)

Research Output (continued)

- Ichitaro Yamazaki, Edmond Chow, **Aurélien Bouteiller**, Jack J. Dongarra: *Performance of asynchronous optimized Schwarz with one-sided communication*. *Parallel Comput.* 86: 66-81 (2019)
- Thomas Héroult, Yves Robert, **Aurélien Bouteiller**, Dorian C. Arnold, Kurt B. Ferreira, George Bosilca, Jack J. Dongarra: *Checkpointing Strategies for Shared High-Performance Computing Platforms*. *IJNC* 9(1): 28-52 (2019)
- George Bosilca, **Aurélien Bouteiller**, Amina Guermouche, Thomas Héroult, Yves Robert, Pierre Sens, Jack J. Dongarra: *A failure detector for HPC platforms*. *IJHPCA* 32(1): 139-158 (2018)
- Ralph H. Castain, Joshua Hursey, **Aurélien Bouteiller**, David G. Solt: *PMIx: Process management for exascale environments*. *Parallel Computing* 79: 9-29 (2018)
- **Aurélien Bouteiller**, Thomas Héroult, George Bosilca, Peng Du, Jack Dongarra: *Algorithm-Based Fault Tolerance for Dense Matrix Factorizations, Multiple Failures and Accuracy*. *ACM Trans. Parallel Computing* 1(2), pp.1-28, doi:10.1145/2686892 (ACM, 2015)
- George Bosilca, **Aurélien Bouteiller**, Thomas Héroult, Yves Robert, Jack J. Dongarra: *Composing resilience techniques: ABFT, periodic and incremental checkpointing*. *International Journal of Networking and Computing* 5(1), pp. 2-25 (2015)
- George Bosilca, **Aurélien Bouteiller**, Elisabeth Brunet, Franck Cappello, Jack J. Dongarra, Amina Guermouche, Thomas Héroult, Yves Robert, Frédéric Vivien, Dounia Zaidouni. *Unified model for assessing checkpointing protocols at extreme-scale*. *Concurrency and Computation: Practice and Experience* 26(17), pp. 2773-3791 (2014)
- Wesley Bland, **Aurélien Bouteiller**, Thomas Héroult, Joshua Hursey, George Bosilca, Jack J. Dongarra. *An evaluation of User-Level Failure Mitigation support in MPI*. *Computing* 95(12): 1171-1184 (2013)
- **Aurélien Bouteiller**, Thomas Héroult, George Bosilca, Jack J. Dongarra. *Correlated set coordination in fault tolerant message logging protocols for many-core clusters*. *Concurrency and Computation: Practice and Experience* 25(4): 572-585 (2013)
- Wesley Bland, Peng Du, **Aurélien Bouteiller**, Thomas Héroult, George Bosilca, Jack J. Dongarra. *Extending the scope of the Checkpoint-on-Failure protocol for forward recovery in standard MPI*. *Concurrency and Computation: Practice and Experience* 25(17): 2381-2393 (2013)
- George Bosilca, **Aurélien Bouteiller**, Anthony Danalis, Mathieu Faverge, Thomas Héroult, Jack J. Dongarra. *PaRSEC: Exploiting Heterogeneity to Enhance Scalability*. *Computing in Science and Engineering* 15(6): 36-45 (2013)
- Wesley Bland, **Aurélien Bouteiller**, Thomas Héroult, George Bosilca, Jack Dongarra *Post-failure recovery of MPI communication capability: Design and rationale*. *IJHPCA* 27(3): 244-254 (2013)
- George Bosilca, **Aurélien Bouteiller**, Anthony Danalis, Thomas Héroult, Pierre Lemarinier, Jack Dongarra. *DAGuE: A generic distributed DAG engine for High Performance Computing*. *Parallel Computing* 38(1-2): 37-51 (2012)
- Teng Ma, George Bosilca, **Aurélien Bouteiller**, Jack J. Dongarra: *Kernel-assisted and topology-aware MPI collective communications on multicore/many-core platforms*. *J. Parallel Distrib. Comput.* 73(7): 1000-1010 (2013)
- Peng Du, **Aurélien Bouteiller**, George Bosilca, Thomas Héroult, Jack J. Dongarra: *Algorithm-based fault tolerance for dense matrix factorizations*. *SIGPLAN Not.* 47(8), pp. 225-234, doi:10.1145/2370036.2145845, ACM, 2012
- **Aurélien Bouteiller**, George Bosilca, Jack Dongarra. *Redesigning the message logging model for high performance*. *Concurrency and Computation: Practice and Experience* 22(16): 2196-2211 (2010)
- **Aurélien Bouteiller**, Thomas Héroult, Pierre Lemarinier, Franck Cappello. *Hybrid Preemptive Scheduling of MPI applications on Grids*. *International Journal of High Performance Computing and Applications (IJHPCA)* – Volume 20, Spring 2006, Sage Publications.
- **Aurélien Bouteiller**, Thomas Héroult, Geraud Krawezik, Pierre Lemarinier, Franck Cappello. *MPICH-V Project: A Multiprotocol Automatic Fault-Tolerant MPI*. *International Journal of High Performance Computing and Applications (IJHPCA)* – Volume 20, Summer 2006, Sage Publications.
- **Aurélien Bouteiller**, Pierre Lemarinier, Geraud Krawezik, Franck Cappello. *Coordinated checkpoint versus message log for fault tolerant MPI*. *International Journal of high performance Computing and Networking (IJHPCN)*. Inderscience publishers.

Research Output (continued)

International Conference Publications

- Qinglei Cao, George Bosilca, Wei Wu, Dong Zhong, **Aurelien Bouteiller**, Jack J. Dongarra: *Flexible Data Redistribution in a Task-Based Runtime System*. CLUSTER 2020: 221-225
- Dong Zhong, **Aurélien Bouteiller**, Xi Luo, George Bosilca: *Runtime level failure detection and propagation in HPC systems*. EuroMPI 2019: 14:1-14:11
- Nuria Losada, **Aurélien Bouteiller**, George Bosilca: *Asynchronous Receiver-Driven Replay for Local Rollback of MPI Applications*. FTXS@SC 2019: 1-10
- Valentin Le Fèvre, George Bosilca, **Aurelien Bouteiller**, Thomas Héroult, Atsushi Hori, Yves Robert, Jack J. Dongarra: *Do Moldable Applications Perform Better on Failure-Prone HPC Platforms?* Euro-Par Workshops 2018: 787-799
- Thomas Héroult, Yves Robert, **Aurelien Bouteiller**, Dorian C. Arnold, Kurt B. Ferreira, George Bosilca, Jack J. Dongarra: *Optimal Cooperative Checkpointing for Shared High-Performance Computing Platforms*. IPDPS Workshops 2018: 803-812
- **Aurelien Bouteiller**, Swaroop Pophale, Swen Boehm, Matthew B. Baker, Manjunath Gorentla Venkata: *Evaluating Contexts in OpenSHMEM-X Reference Implementation*. OpenSHMEM 2017: 50-62
- Ralph H. Castain, David G. Solt, Joshua Hursey, **Aurelien Bouteiller**: *PMIx: process management for exascale environments*. EuroMPI/USA 2017: 14:1-14:10
- Khairul Kabir, Azzam Haidar, Stanimire Tomov, **Aurelien Bouteiller**, Jack J. Dongarra: *A Framework for Out of Memory SVD Algorithms*. Proceedings of the International Supercomputing Conference (ISC'17), 158-178
- George Bosilca, **Aurelien Bouteiller**, Amina Guermouche, Thomas Héroult, Yves Robert, Pierre Sens, Jack J. Dongarra: *Failure detection and propagation in HPC systems*. Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'16): 27:1-27:11
- **Aurelien Bouteiller**, George Bosilca, Manjunath Gorentla Venkata: *Surviving Errors with OpenSHMEM*. OpenSHMEM 2016: 66-81
- Thomas Héroult, **Aurelien Bouteiller**, George Bosilca, Marc Gamell, Keita Teranishi, Manish Parashar, Jack J. Dongarra: *Practical scalable consensus for pseudo-synchronous distributed systems*. Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC'15), Austin, TX, pp. 1-12, doi:10.1145/2807591.2807665, ACM, 2015
- Wei Wu, **Aurelien Bouteiller**, George Bosilca, Mathieu Faverge, Jack J. Dongarra: *Hierarchical DAG Scheduling for Hybrid Distributed Systems*. Parallel and Distributed Processing Symposium (IPDPS'15), pp. 156-165, doi:10.1109/IPDPS.2015.56, IEEE International, 2015
- **Aurelien Bouteiller**, George Bosilca, Jack J. Dongarra: *Plan B: Interruption of Ongoing MPI Operations to Support Failure Recovery*. Proceedings of the 22nd European MPI Users' Group Meeting, Bordeaux, France, pp. 1-9, doi:10.1145/2802658.2802668, ACM, 2015
- P. Shamis, M. G. Venkata, M. G. Lopez, M. B. Baker, O. Hernandez, Y. Itigin, M. Dubman, G. Shainer, R. L. Graham, L. Liss, Y. Shahar, S. Potluri, D. Rossetti, D. Becker, D. Poole, C. Lamb, S. Kumar, C. Stunkel, G. Bosilca, **A. Bouteiller**: *UCX: An Open Source Framework for HPC Network APIs and Beyond*. 23rd Annual Symposium on High-Performance Interconnects (HOTI'15), pp. 40-43, doi:10.1109/HOTI.2015.13, IEEE, 2015
- Chunyan Tang, **Aurelien Bouteiller**, Thomas Héroult, Manjunath Gorentla Venkata, George Bosilca: *From MPI to OpenSHMEM: Porting LAMMPS*. OpenSHMEM and Related Technologies. Experiences, Implementations, and Technologies, Volume 9397 of the series Lecture Notes in Computer Science, pp. 121-137, doi:10.1007/978-3-319-26428-8_8, Annapolis, MD, USA, Springer, 2015
- Atsushi Hori, Kazumi Yoshinaga, Thomas Héroult, **Aurelien Bouteiller**, George Bosilca, Yutaka Ishikawa : *Sliding Substitution of Failed Nodes*. Proceedings of the 22nd European MPI Users' Group Meeting, Bordeaux, France, pp. 1-10, doi:10.1145/2802658.2802670, ACM, 2015
- Anthony Danalis, George Bosilca, **Aurelien Bouteiller**, Thomas Héroult, Jack J. Dongarra: *PTG: an abstraction for unhindered parallelism*. Proceedings of the Fourth International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing, New Orleans, Louisiana, pp. 21-30, doi:10.1109/WOLFHPC.2014.8, IEEE Press, 2014
- **Aurelien Bouteiller**, Thomas Héroult, George Bosilca: *A Multithreaded Communication Substrate for OpenSHMEM*. Proceedings of the 8th International Conference on Partitioned Global Address Space Programming Models, Eugene, OR, USA, pp. 1-2, doi:10.1145/2676870.2676895, ACM, 2014
- George Bosilca, **Aurelien Bouteiller**, Thomas Héroult, Yves Robert, Jack J. Dongarra: *Assessing the Impact of ABFT and Checkpoint Composite Strategies*. Parallel & Distributed Processing Symposium Workshops, pp. 679-688, 10.1109/IPDPSW.2014.79, IEEE International, 2014

Research Output (continued)

- Voldomir Turchenko, George Bosilca, **Aurelien Bouteiller**, Jack J. Dongarra: *Efficient parallelization of batch pattern training algorithm on many-core and cluster architectures*. Intelligent Data Acquisition and Advanced Computing Systems (IDAACS), 2013 IEEE 7th International Conference on (Volume: 02) 692-698
- **Aurelien Bouteiller**, Franck Cappello, Jack Dongarra, Amina Guermouche, Thomas Héroult, Yves Robert: *Multi-criteria Checkpointing Strategies: Response-Time versus Resource Utilization*. Euro-Par 2013: 420-431
- George Bosilca, **Aurelien Bouteiller**, Anthony Danalis, Thomas Héroult, Jack Dongarra: *From Serial Loops to Parallel Execution on Distributed Systems*. Euro-Par 2012: 246-257
- Wesley Bland, Peng Du, **Aurelien Bouteiller**, Thomas Héroult, George Bosilca, Jack Dongarra: *A Checkpoint-on-Failure Protocol for Algorithm-Based Recovery in Standard MPI*. Euro-Par 2012: 477-488 – **best paper**
- Teng Ma, George Bosilca, **Aurelien Bouteiller**, Jack Dongarra: *HierKNEM: An Adaptive Framework for Kernel-Assisted and Topology-Aware Collective Communications on Many-core Clusters*. IPDPS 2012: 970-982 – **best paper**
- Peng Du, **Aurelien Bouteiller**, George Bosilca, Thomas Héroult, Jack Dongarra: *Algorithm-based fault tolerance for dense matrix factorizations*. Proceedings of the 17th ACM SIGPLAN symposium on Principles and Practice of Parallel Programming (PPoPP'12), New Orleans, Louisiana, USA, pp. 225-234, doi:10.1145/2145816.2145845, ACM, 2012
- Wesley Bland, **Aurelien Bouteiller**, Thomas Héroult, Joshua Hursey, George Bosilca, Jack J. Dongarra: *An Evaluation of User-Level Failure Mitigation Support in MPI*. EuroMPI 2012: 193-203
- George Bosilca, **Aurelien Bouteiller**, Thomas Héroult, Pierre Lemarinier, Narapat Ohm Saengpatsa, Stanimire Tomov, Jack J. Dongarra: *Performance Portability of a GPU Enabled Factorization with the DAGuE Framework*. CLUSTER 2011: 395-402
- **Aurelien Bouteiller**, Thomas Héroult, George Bosilca, Jack J. Dongarra: *Correlated Set Coordination in Fault Tolerant Message Logging Protocols*. Euro-Par (2) 2011: 51-64 – **best paper**
- Teng Ma, George Bosilca, **Aurelien Bouteiller**, Brice Goglin, Jeffrey M. Squyres, Jack J. Dongarra: *Kernel Assisted Collective Intra-node MPI Communication among Multi-Core and Many-Core CPUs*. ICPP 2011: 532-541
- George Bosilca, **Aurelien Bouteiller**, Anthony Danalis, Thomas Héroult, Pierre Lemarinier, Jack Dongarra: *DAGuE: A Generic Distributed DAG Engine for High Performance Computing*. IPDPS Workshops 2011: 1151-1158
- George Bosilca, **Aurelien Bouteiller**, Anthony Danalis, Mathieu Faverge, Azzam Haidar, Thomas Héroult, Jakub Kurzak, Julien Langou, Pierre Lemarinier, Hatem Ltaief, Piotr Luszczek, Asim YarKhan, Jack Dongarra: *Flexible Development of Dense Linear Algebra Algorithms on Massively Parallel Architectures with DPLASMA*. IPDPS Workshops 2011: 1432-1441
- Teng Ma, **Aurelien Bouteiller**, George Bosilca, Jack J. Dongarra: *Impact of Kernel-Assisted MPI Communication over Scientific Applications: CPMD and FFTW*. EuroMPI 2011: 247-254
- Teng Ma, **Aurelien Bouteiller**, George Bosilca, Jack J. Dongarra: *Locality and Topology aware Intra-node Communication Among Multicore CPUs.*, Proceedings of the 17th IEEE EuroMPI conference, Stuttgart, Germany, September, 2010. LNCS, Springer.
- George Bosilca, **Aurelien Bouteiller**, Thomas Héroult, Pierre Lemarinier, Dongarra, J.. *Dodging the Cost of Unavoidable Memory Copies in Message Logging Protocols.*, Proceedings of 17th IEEE EuroMPI conference, Stuttgart, Germany, September, 2010. LNCS, Springer.
- **Aurelien Bouteiller**, Thomas Ropars, George Bosilca, Christine Morin, Jack Dongarra: *Reasons for a pessimistic or optimistic message logging protocol in MPI uncoordinated failure, recovery.*, Proceedings of the 2009 IEEE Cluster conference, New Orleans, LA, USA, September 2009. IEEE.
- **Aurelien Bouteiller**, Frederic Desprez. *Fault Tolerance Management for a Hierarchical GridRPC Middleware*. 8th IEEE International Symposium on Cluster Computing and the Grid (CCGrid'08), Lyon.
- **Aurelien Bouteiller**, George Bosilca, Jack Dongarra. *Retrospect: Deterministic Relay of MPI Applications for Interactive Distributed Debugging*. 14th Euro PVM/MPI User's group meeting, Paris, September 2007. Springer.
- Abelkader Amar, Raphaël Bolze, **Aurélien Bouteiller**, Pushpinder Kaur Chouhan, Andréa Chis, Yves Caniou, Eddy Caron, Holly Dail, Benjamin Depardon, Frédéric Desprez, Jean-Sébastien Gay, Gaël Le Mahec, and Alan Su. *DIET: New Developments and Recent Results*. CoreGRID Workshop on Grid Middleware (in conjunction with EuroPar2006), number 4375 of LNCS, Dresden, August 2006. Springer.
- **Aurelien Bouteiller**, Boris Collin, Thomas Héroult, Pierre Lemarinier, Franck Cappello. *Impact of Event Logger on Causal Message Logging Protocols for Fault Tolerant MPI*. 19th IEEE/ACM International Parallel and Distributed Processing Symposium (IPDPS 05), Denver USA, April 2005. IEEE/ACM.

Research Output (continued)

- **Aurelien Bouteiller**, Hinde-Lilia Bouziane, Thomas Herault, Pierre Lemarinier, Franck Cappello. *Hybrid Preemptive Scheduling of MPI Applications on the Grids*. 5th International Workshop on Grid Computing (Grid04), Pittsburgh USA, November 2004. IEEE/ACM.
- **Aurelien Bouteiller**, Pierre Lemarinier, Thomas Héroult, Géraud Krawezik, Franck Cappello. *Improved Message Logging versus Improved Coordinated Checkpointing for Fault Tolerant MPI*. International Conference on Cluster Computing (Cluster 2004) , San-Diego, USA, september 2004. IEEE.
- **Aurelien Bouteiller**, Pierre Lemarinier, Géraud Krawezik, Franck Cappello. *Coordinated checkpoint versus message log for fault tolerant MPI*. International Conference on Cluster Computing (Cluster 2003), Hong-kong, december 2003. IEEE.
- Pierre Lemarinier, **Aurelien Bouteiller**, Franck Cappello. *MPICH-V3: MPICH-V3: Toward a High Performance Fault Tolerant MPI for Cluster of Clusters Grid*. High Performance Networking and Computing (SC2003) poster session, Phoenix USA, November 2003. IEEE/ACM.
- **Aurelien Bouteiller**, Franck Cappello, Thomas Héroult, Géraud Krawezik, Pierre Lemarinier, Frédéric Magniette. *MPICH-V2: a fault tolerant MPI for volatile nodes based on pessimistic sender based message logging*. High Performance Networking and Computing (SC2003) , Phoenix USA, November 2003. IEEE/ACM.
- George Bosilca, **Aurelien Bouteiller**, Franck Cappello, Samir Djilali, Gilles Fédak, Cécile Germain, Thomas Héroult, Pierre Lemarinier, Oleg Lodygensky, Frédéric Magniette, Vincent Néri, Anton Selikhov. *MPICH-V: Toward a Scalable Fault Tolerant MPI for Volatile Nodes*. Proceedings of the 2002 ACM/IEEE conference on Supercomputing (SC'02), Baltimore, Maryland, pp. 1-18, IEEE Computer Society Press, 2002

Technical Reports

- Héroult, T., **Bouteiller, A.**, Bosilca, G., Gamell, M., Teranishi, K., Parashar, M. and Dongarra, J., *Practical Scalable Consensus for Pseudo-Synchronous Distributed Systems: Formal Proof*. University of Tennessee Computer Science Technical Report ICL-UT-15-01 (April, 2015).
- Bosilca, G., **Bouteiller, A.**, Héroult, T., Robert, Y. and J. Dongarra, *Assessing the impact of ABFT and Checkpoint composite strategies*. University of Tennessee Computer Science Technical Report ICL-UT-13-03 (September 2013).
- **Bouteiller, A.**, Cappello, F., Dongarra, J., Guermouche, A., Héroult, T. and Robert, Y., *Multi-criteria checkpointing strategies: optimizing response-time versus resource utilization*. University of Tennessee Computer Science Technical Report ICL-UT-13-01 (February 15, 2013).
- Bosilca, G., **Bouteiller, A.**, Brunet, E., Cappello, F., Dongarra, J., Guermouche, A., Héroult, T., Robert, Y., Vivien, F. and Zaidouni, D., *Unified Model for Assessing Checkpointing Protocols at Extreme-Scale*. University of Tennessee Computer Science Technical Report (also LAWN 269) UT-CS-12-697 (June 2012).
- Bland, W., Bosilca, G., **Bouteiller, A.**, Héroult, T. and Dongarra, J., *A Proposal for User-Level Failure Mitigation in the MPI-3 Standard*. University of Tennessee Electrical Engineering and Computer Science Technical Report UT-CS-12-693 (February 24, 2012).
- Bland, W., Du, P., **Bouteiller, A.**, Héroult, T., Bosilca, G. and Dongarra, J., *Extending the Scope of the Checkpoint-on-Failure Protocol for Forward Recovery in Standard MPI*. University of Tennessee Computer Science Technical Report UT-CS-12-702 (2012).
- Du, P., **Bouteiller, A.**, Bosilca, G., Héroult, T. and Dongarra, J., *Algorithm-based Fault Tolerance for Dense Matrix Factorizations*. University of Tennessee Computer Science Technical Report UT-CS-11-676 (August 05, 2011).
- Ma, T., Bosilca, G., **Bouteiller, A.**, Goglin, B., Squyres, J. and Dongarra, J., *Kernel Assisted Collective Intra-node Communication Among Multicore and Manycore CPUs*. University of Tennessee Computer Science Technical Report UT-CS-10-663 (November 2010). Bosilca, G., **Bouteiller, A.**, Danalis, A., Faverge, M., Haidar, H., Héroult, T., et al., *Distributed Dense Numerical Linear Algebra Algorithms on Massively Parallel Architectures: DPLASMA*. University of Tennessee Computer Science Technical Report UT-CS-10-660 (September 15, 2010).
- Bosilca, G., **Bouteiller, A.**, Danalis, A., Héroult, T., Lemarinier, P. and Dongarra, J., *DAGuE: A generic distributed DAG engine for high performance computing*. Innovative Computing Laboratory Technical Report ICL-UT-10-01 (April 11, 2010).
- Bosilca, G., **Bouteiller, A.**, Danalis, A, Faverge, M., Haidar, A., Héroult, T., Kurzak, J., Langou, J., et al., *Distributed-Memory Task Execution and Dependence Tracking within DAGuE and the DPLASMA Project*. Innovative Computing Laboratory Technical Report ICL-UT-10-02 (2010).

Research Output (continued)

Software

- ULFM-MPI *Implementation of the Fault Tolerant MPI standard draft (UTK).*
- PARSEC *A Direct Acyclic Graph execution engine for unfolding dataflow task dependencies on HPC systems (UTK).*
- DPLASMA *A Linear Algebra library based on top of PaRSEC, providing ScaLAPACK functionalities with 2x to 20x speedup (UTK).*
- FT-LA *A parallel linear algebra package, similar in functionalities to ScaLAPACK, but resilient to failures (UTK).*
- OPEN MPI-V *A Fault tolerant framework for Checkpoint/Restart with High Performance interconnects in the Open MPI library (UTK).*
- MPICH-V *A multi-protocol framework for studying automatic fault tolerant protocols with the MPICH library. Includes coordinated, pessimistic and causal protocols (LRI/INRIA).*
- MPICH-CL *An automatic fault tolerant MPI library, using a Chandy&Lamport coordinated snapshot protocol (LRI/INRIA).*
- MPICH-V2 *An automatic fault tolerant MPI library, using a sender-based pessimistic logging protocol (LRI/INRIA).*
- MPICH-V1 *An automatic fault tolerant MPI library, using a remote pessimistic logging protocol (LRI/CNRS).*
- PHOENIX *Design and implementation of a multi-agent framework for energy based distributed task scheduling. During B.S. apprenticeship at INSA Rouen/Ar@knyde SA.*

Service to the Scientific Community

Memberships

- PMIx Administrative Steering Committee Secretary (since 2020)
- Founding member of the ACM ASCAN SIGHPC Chapter–Appalachia Region (Since 2020)
- Member of the MPI (Message Passing Interface) standardization committee (since 2012).
- Member of the OpenSHMEM standardization committee (2015–2018)
- Organizing Committee Member - 12th Scheduling for Large Scale Systems Workshop (May 24-26, 2017)

Editorial Review Boards for International Journals

- Editorial Review Board member for IEEE Transactions on Parallel and Distributed Systems (TPDS) (since 2020)

Reviewing Activities for International Journals

- IEEE Transactions on Computers (TC)
- Communications of the ACM
- IEEE Transactions on Parallel and Distributed Systems (TPDS)
- Future Generation Computer Systems (FGCS)
- Journal of Parallel and Distributed Computing (JPDC)
- Parallel Computing (PARCO)
- Computers & Electrical Engineering (Computers)
- IEEE Transactions on Cloud Computing (TCC)
- International Journal of High Performance Computing Application (IJHPCA)
- Journal of Systems and Softwares (JSS)
- Lecture Notes in Computer Science (LNCS)
- Information Processing Letters (IPL)
- Journal of Computer Science and Technology (JCST).

Service to the Scientific Community (continued)

Program Committee Member for International Conferences

- 25th, 24th International European Conference on Parallel and Distributed Computing (Euro-Par) (2019, 2018)
- IEEE CLUSTER 2019 (2019)
- The 30th International Conference for High Performance Computing, Networking, Storage, and Analysis (SC'18) (2018)
- 48th, 47th, 46th International Conference on Parallel Processing (ICPP) (2019, 2018, 2017)
- 26th, 24th, and 18th EuroMPI Conference (2019, 2017, 2011)
- 17th, 15th, and 14th International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms (HeteroPar) (2019, 2017, 2016)
- 28th, and 27th IEEE International Parallel & Distributed Processing Symposium (IPDPS) (2014, 2013)
- 21th, and 20th IEEE Conference on High Performance Computing (HiPC) (2014, 2013)
- 1st Extending MPI for Resilience Workshop (EMPIRe) (2017)
- 10th to 3rd workshop on Fault-Tolerance for HPC at Extreme Scale (FTXS) (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)
- 4th, 3rd, 2nd, 1st Workshop on Fault Tolerant Systems (FTS) (2018, 2017, 2016, 2015)
- 3rd Workshop on OpenSHMEM and Related Technologies (OpenSHMEM) (2016)
- International Workshop on Heterogeneous Architectures and Computing (ISPA-HAC) (2012)
- 7th, 4th, 3rd, and 2nd Workshop on Resiliency in High Performance Computing (Resilience) (2014, 2011, 2010, 2009)

Service to the community

- Reviewer for many international conferences with reviewing committees, in particular SuperComputing, IPDPS, ICS, CCGRID, HPDC, HiPC, SPAA, Heterogeneous Computing Workshop (HCW), EuroPar, VecPar, ICCS, EuroPVM/MPI, ...
- Parallelism & Grand-Large seminar course organizer September 2003–September 2004 (11 seminars during the year).
- March 2003 ACI GRID CGP2P meeting organizer at the CNRS Michel-Ange campus, Paris.

Teaching

M.S. level teaching – University of Paris XI

- MPI and high performance networking issues and benchmarking presentation (3 hours) in the High Performance Computing course.
- High Performance Computing course jury.

M.S. apprenticeship tutoring – University of Paris XI

- | | |
|------|---|
| 2003 | • Hybrid scheduling of MPI applications for clusters. |
| 2003 | • Causal protocol study for fault tolerant MPI. |
| 2004 | • Hybrid adaptive scheduling for Grids. |
| 2004 | • MPICH-V3 : a fault tolerant MPI for Grids. |

M.S. level teaching – University of Rouen, ENS Lyon

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|--------|------------------------|
| 1 year | • Graphs. |
| 1 year | • Network programming. |
| 1 year | • Unix systems. |

Graduate B.S. level apprenticeship tutoring – University of Paris XI

- Sharing and discovering of peer-to-peer resources over a transient ad-hoc wireless network.

Teaching (continued)

- Test parallel applications for fault tolerant MPI library.
- Constrained cluster login management web interface.
- Constrained cluster login tool : exclusive and group exclusive login and checkpoint/restart based priority.

B.S. level teaching – Orsay’s science community college

- 1 year • Algorithmic.
- 2 years • C++ Programming.
- 3 years • UNIX Systems.
- 3 years • Networks and Systems.
- 2 years • Network programming.
- 1 year • 2nd year final project tutoring.

Miscellaneous

Programming Languages and Technologies

- Expert • C, L^AT_EX, Shell, MPI, OpenSHMEM, OpenMP, OpenACC, Linux, Parallel Computing.
- Proficient • C++, Java, CAML, Pascal, Lisp, PHP, HTML, Perl, Python, Windows, *NIX.

Non academic professional experience

- Final B.S. level engineering apprenticeship, *Design and implementation of a multi-agent framework for energy based distributed task scheduling*. March - August 2001, INSA Rouen / Ar@knyde SA.
- Free access computer classrooms mentoring, *Educational support for 1st and 2nd year students, Window NT 3.51 system administration*. September 1999 - June 2001, University of Rouen.
- Industrial handling, oil refinery ELF Sotteville-Les-Rouen. July - August 1998, Elf lubs.

Community Service

- Treasurer of the University of Tennessee Badminton club for year 2008.
- Vice-president of the AUREFI (university of Rouen computer science society), between 2000 and 2001.