Jean-Baptiste **Besnard**

Manager · Technical Leader

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Experience

Manager and Technical Leader
Bruyère-le-Châtel, France

ParaTools SAS
Sept. 2016 - present

- Lead a team of consultants to timely meet their objectives
- Identify and conduct innovative R&D studies and developments
- Manage R&D projets with public fundings

Teaching Module Lead
Versailles, France

Université de Versailles Saint-Quentin (UVSQ)
Jan. 2019 - present

- Courses on Operating Systems internal architecture for M1 students

High-Performance Computing (HPC) Consultant
Bruyère-le-Châtel, France

ParaTools SAS
Aug. 2014 - Sept. 2016

- System-level development in a thread-based MPI runtime, updated from 2.0 to 3.1 standard
- Development of an RDMA interface for Infiniband cards (libverbs)
- Development of a GCC compiler plugin promoting global variables to TLS

Research Engineer
Versailles, France

Exascale Computing Research
Oct. 2013 - Aug. 2014

- Develop innovative web-based interfaces for a profiling tool

Teaching Assitant
Velizy, France

Institut des Sciences et Techniques des Yvelines (ISTY)
Oct. 2013 - Jul. 2014

- Processor architecture for second year engineering students

Ph.D. Student
Bruyères-le-Châtel, France

CEA, DAM, DIF
Oct. 2010 - Jul. 2013

- Parallel profiling and tracing of massively parallel applications (MPI + OpenMP)

Teaching Assistant
Versailles, France

Université de Versailles Saint-Quentin (UVSQ)
Oct. 2012 - Jul. 2013

- Advanced compilation techniques (M2)

Teaching Assistant
Versailles, France

Université de Versailles Saint-Quentin (UVSQ)
Oct. 2011 - Jul. 2012

- C programming and UNIX environments (M1)
- Parallel optimization and profiling using MPI and OpenMP (M1)

Skills

Programming languages	C, Python, JavaScript (Node.js), Go, C++, Ba(sh)
Parallelism abstractions	MPI, OpenMP, Pthread
Communication layers	TCP, MPI, Infiniband, gRPC
Management	Team lead, customer facing, budget management
R&D	Research paper writing, funding application, standardization commitee (MPI)
Proficient languages	French (Native), English

Projects

Muti-Processor Computing
A thread-based unified implementation of MPI and OpenMP

C, Fortran, MPI, OpenMP
hpcframework.com/mpc/

- Updated MPC from the Message Passing Interface standard (MPI) 2.0 to 3.1
- Developed the RDMA interface (Infiniband) in MPC
- Integrated MPI-IO inside MPC
- Added support for Fortran bindings
- Worked on collective communication algorithms
- Implemented a privatization plugin inside GCC

pcocc
Private Cloud On a Compute Cluster

Python, OCI, Docker, Go, gRPC
github.com/cea-hpc/pcocc

- Implement a Pod agent in GO and GRPC to run containers inside VMs
- Integrate rootless container support inside pcocc
- OCI image and bundle conversion and storage

TAU
The TAU Performance System

Profiling, IO, MPI, Monitoring
hpcframework.com/mpc/

- Development of dedicated connectors for Prometheus
- Conception of a Prometheus data-aggregator for I/O time-series
- Work on trace-format processing tools

Muti-Application Online Profiling
An In-Situ profiling tool for MPI applications

C, MPI, OpenMP, Node.js, HTML
hpcframework.com/malp/

- Massive IO for tracing of MPI applications 100s of TB
- Instrumentation for MPI, OpenMP and Posix calls
- In-Situ processing using MPMD MPI
- Web-GUI using Node.JS for data-visualization

Education

Ph.D. in Computer Science
CEA, DAM, DIF

Bruyères-le-Châtel, France
Oct. 2010 - Sept. 2013

- Profiling and debugging of massively parallel applications.

Engineering Diploma
Institut Supérieur de l'Électronique et du Numérique (ISEN)

Brest, France
Sept. 2007 - Jun. 2010

- Specialization in Telecommunication and Networks.

Preparatory Mathematics Classes
Institut Supérieur de l'Électronique et du Numérique (ISEN)

Brest, France
Sept. 2005 - Jun. 2007

- Specialization in Telecommunication and Networks.

Publications

- Jean-Baptiste Besnard, Sameer Shende, Allen Malony, Julien Jaeger, and Marc Perache. Enabling global mpi process addressing in mpi applications. In *Proceedings of the 29th European MPI Users' Group Meeting*, EuroMPI/USA'22, page 27–36, New York, NY, USA, 2022. Association for Computing Machinery.

- Jean-Baptiste Besnard, Julien Adam, Allen D Malony, Sameer Shende, Julien Jaeger, Patrick Carribault, and Marc Pérache. Exploring space-time trade-off in backtraces. In *Tools for High Performance Computing 2018/2019*, pages 151–168. Springer, 2021.

- Julien Adam, Maxime Kermarquer, Jean-Baptiste Besnard, Leonardo Bautista-Gomez, Marc Pérache, Patrick Carribault, Julien Jaeger, Allen D. Malony, and Sameer Shende. Checkpoint/restart approaches for a thread-based MPI runtime. *Parallel Computing*, 85:204–219, 2019.

- Jean-Baptiste Besnard, Julien Jaeger, Allen D. Malony, Sameer Shende, Hugo Taboada, Marc Pérache, and Patrick Carribault. Mixing ranks, tasks, progress and nonblocking collectives. In *Proceedings of the 26th European MPI Users' Group Meeting*, EuroMPI '19, New York, NY, USA, 2019. Association for Computing Machinery.

- Jean-Baptiste Besnard, Allen D. Malony, Sameer Shende, Marc Pérache, Patrick Carribault, and Julien Jaeger. Unifying the analysis of performance event streams at the consumer interface level. In Christoph Niethammer, Michael M. Resch, Wolfgang E. Nagel, Holger Brunst, and Hartmut Mix, editors, *Tools for High Performance Computing 2017*, pages 57–71, Cham, 2019. Springer International Publishing.

- Julien Adam, Jean-Baptiste Besnard, Allen D. Malony, Sameer Shende, Marc Pérache, Patrick Carribault, and Julien Jaeger. Transparent high-speed network checkpoint/restart in MPI. In *Proceedings of the 25th European MPI Users' Group Meeting, Barcelona, Spain, September 23-26, 2018*, pages 12:1–12:11, 2018.

- Jean-Baptiste Besnard, Allen D. Malony, Sameer Shende, Marc Pérache, Patrick Carribault, and Julien Jaeger. Towards a better expressiveness of the speedup metric in MPI context. In *46th International Conference on Parallel Processing Workshops, ICPP Workshops 2017, Bristol, United Kingdom, August 14-17, 2017*, pages 251–260, 2017.

- Antoine Capra, Patrick Carribault, Jean-Baptiste Besnard, Allen D. Malony, Marc Pérache, and Julien Jaeger. User co-scheduling for mpi+openmp applications using openmp semantics. In *Scaling OpenMP for Exascale Performance and Portability - 13th International Workshop on OpenMP, IWOMP 2017, Stony Brook, NY, USA, September 20-22, 2017, Proceedings*, pages 203–216, 2017.

- Jean-Baptiste Besnard, Julien Adam, Sameer Shende, Marc Pérache, Patrick Carribault, and Julien Jaeger. Introducing task-containers as an alternative to runtime-stacking. In *Proceedings of the 23rd European MPI Users' Group Meeting, EuroMPI 2016, Edinburgh, United Kingdom, September 25-28, 2016*, pages 51–63, 2016.

- Jean-Baptiste Besnard, Allen D. Malony, Sameer Shende, Marc Pérache, and Julien Jaeger. Gleaming the cube: Online performance analysis and visualization using malp. In Andreas Knüpfer, Tobias Hilbrich, Christoph Niethammer, José Gracia, Wolfgang E. Nagel, and Michael M. Resch, editors, *Tools for High Performance Computing 2015*, pages 53–66, Cham, 2016. Springer International Publishing.

- Jean-Baptiste Besnard, Allen D. Malony, Sameer Shende, Marc Pérache, Patrick Carribault, and Julien Jaeger. An MPI halo-cell implementation for zero-copy abstraction. In *Proceedings of the 22nd European MPI Users' Group Meeting, EuroMPI 2015, Bordeaux, France, September 21-23, 2015*, pages 3:1–3:9, 2015.

- Jean-Baptiste Besnard. *Profiling and debugging by efficient tracing of hybrid multi-threaded HPC applications. (Profilage et débogage par prise de traces efficaces d'applications hybrides multi-threadées HPC)*. PhD thesis, Versailles Saint-Quentin-en-Yvelines University, France, 2014.

- Jean-Baptiste Besnard, Marc Pérache, and William Jalby. Event streaming for online performance measurements reduction. In *42nd International Conference on Parallel Processing, ICPP 2013, Lyon, France, October 1-4, 2013*, pages 985–994, 2013.

Program Committees

Year	Role	Venue
2022	**Reviewer**, ProTools 2022: Workshop on Programming and Performance Visualization Tools	*SC22 Workshop*
2022	**Reviewer (Performance Measurement, Modeling, and Tools)**, The International Conference for High Performance Computing, Networking, Storage, and Analysis, SC 2022	*Conference*
2022	**Reviewer**, Future Generation Computer Systems 2022	*Journal*
2022	**Reviewer**, HPCMALL 2022 : Malleability Techniques Applications in High-Performance Computing	*Workshop*
2022	**Reviewer (Performance Modeling and Evaluation track)**, 22nd IEEE/ACM International Conference on Cluster, Cloud, and Grid Computing (CCGrid 2022)	*Conference*
2021	**Reviewer**, Future Generation Computer Systems 2021	*Journal*
2021	**Reviewer**, ProTools 2021: Workshop on Programming and Performance Visualization Tools	*SC21 Workshop*
2021	**Reviewer**, ICPP 21 : International Conference on Parallel Processing	*Conference*
2020	**Reviewer**, ProTools 2020: Workshop on Programming and Performance Visualization Tools	*SC20 Workshop*
2020	**Reviewer**, Workshop on Monitoring and Analysis for High Performance Computing Systems Plus Applications 2020 (HPCMaspa 2020)	*Workshop*
2019	**Reviewer**, 1st International Workshop on Containers and New Orchestration Paradigms for Isolated Environments in HPC (CANOPIE HPC 19)	*SC19 Workshop*
2019	**Reviewer**, Workshop on Programming and Performance Visualization Tools (ProTools 19)	*SC19 Workshop*
2019	**Reviewer**, Workshop on Monitoring and Analysis for High Performance Computing Systems Plus Applications 2017 (HPCMaspa 2019)	*Workshop*
2019	**Reviewer (Performance Modeling and Evaluation track)**, 18th IEEE/ACM International Conference on Cluster, Cloud, and Grid Computing (CCGrid 2019)	*Conference*
2018	**Reviewer**, 7th Workshop on Extreme-Scale Programming Tools	*SC18 Workshop*
2018	**Reviewer (Posters)**, EuroMPI 2018	*Conference*
2018	**Reviewer (Performance Track)**, International Conference on Parallel Processing (ICPP)	*Conference*
2018	**Reviewer (Performance Modeling and Evaluation track)**, 18th IEEE/ACM International Conference on Cluster, Cloud, and Grid Computing (CCGrid 2018)	*Conference*
2017	**Reviewer**, Workshop on Monitoring and Analysis for High Performance Computing Systems Plus Applications 2017 (HPCMaspa 2017)	*Workshop*
2017	**Reviewer**, 6th Workshop on Extreme-Scale Programming Tools	*SC17 Workshop*
2017	**Reviewer**, Future Generation Computer Systems 2017	*Journal*
2017	**Reviewer (Posters)**, EuroMPI/USA 2017	*Conference*
2017	**Reviewer (Performance Measurement, Modeling, and Tools)**, The International Conference for High Performance Computing, Networking, Storage, and Analysis, SC 2017	*Conference*
2016	**Reviewer (Performance Measurement, Modeling, and Tools)**, The International Conference for High Performance Computing, Networking, Storage, and Analysis, SC 2016	*Conference*
2016	**Reviewer**, Workshop on Monitoring and Analysis for High Performance Computing Systems Plus Applications 2016 (HPCMaspa 2016)	*Conference*