

CURRICULUM-VITAE

Nicolas Maillard

4/2/2010

Short bio : N. Maillard is Assistant Professor at the Federal University of Rio Grande do Sul, Porto Alegre, Brazil, since March, 2005.

Teaching : Compilers, Operating Systems and Parallel Programming.

Research area : Parallel, High Performance Computing.

Publications : Has published 16 papers in international conference with editorial review and 4 in international journals.

Students Advising : Has supervised 7 Master students. Currently supervising 3 PhD students and 4 Masters.

Committees : Belongs to the Program Committee of the SBAC-PAD conference (<http://www.sbc.org.br/sbac>). Referee of the journal Parco since 2007, of IEEE Trans. on Parallel and Distributed Systems, and of various conferences of HPC (Europar, CCGRID, HiPC, etc.). Finance chairman and member of the Organizing Committee of SBAC-PAD 2007.

Diplomas :

- PhD in Information Sciences and Technologies at the University Joseph Fourier (Grenoble I, France), in 2001.
- Master degree in Applied Mathematics and Parallel Computing, at the University Joseph Fourier (Grenoble I).
- Graduated in 1996, in Applied Mathematics and Computer Science, at the French "Grande École d'Ingénieur" ENSIMAG (École Nationale Supérieure d'Informatique et de Mathématiques Appliquées de Grenoble) - INPG.

ADMINISTRATIVE AND PERSONAL INFORMATION

Last Name : Maillard

First Name : Nicolas Date and place of birth : 23/05/1973, Nantes (France)

Citizenship : French

Sex : Male

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Foreign Languages : English (fluent, spoken and written), Portuguese (fluent, spoken and written), German (spoken and written).

DIPLOMAS

Ph.D. :

- Ph.D from the University Joseph Fourier, speciality "Mathematics, Information Sciences and Technology", obtained on Nov., 19th in Grenoble, France.

Other diplomas (Master's and higher) :

- Master in Applied Mathematics at the University Joseph Fourier, obtained in June 1996 in Grenoble, France.
- Engineer in Applied Mathematics, graduated from the École Nationale Supérieure en Informatique et Mathématiques Appliquées de Grenoble (ENSIMAG), obtained in June 1996 in Grenoble.

TRAINING AND PROFESSIONAL HISTORY

INSTITUTIONS	POSITIONS AND STATUS	DATES		Remarks
		<i>Start</i>	<i>End</i>	
Federal Univ of Rio Grande do Sul (P. Alegre, Brazil)	Assistant Prof.	Mar. 2005		
Federal Univ. of Rio Grande do Sul (P. Alegre, Brazil)	Post-doctoral position	Jan. 2004	Feb. 2005	Hewlett-Packard funding.
Pontificia Univ. Católica do Rio Grande do Sul (PUCRS, Brazil)	Post-doctoral position	June 2002	Dec. 2003	
Univ. J. Fourier (Grenoble, France)	PhD student	Sep. 1996	Nov. 2001	National Draft in 1999.
ENSIMAG (Grenoble, France)	Student	Sep. 1993	Jun. 1996	Master degree in Jun. 96.

PARTICIPATION IN COMMITTEES

I belong to the following committees :

- Program Committee of the conference SBAC'PAD, since 2007.
- Organizing Committee of the conference SBAC'PAD 2007 (Gramado, RS, Brazil. Finance Chairman).

STUDENTS UNDER MY SUPERVISION

- **Rafael Ennes** — Master (2005 - 2007)
Rafael has worked on a library that was tracing the communication graph of MPI programs.
- **Guilherme P. Pezzi** — Master (2005 - Dec. 2006)
Guilherme has worked on the implementation of Divide and Conquer schemes, with Workstealing, in MPI programs that spawn processes at runtime. He is now beginning a PhD in Nice, France, at the INRIA-Sophia-Antipolis.
- **Gustavo Romano** — Master (2006 - 2007)
Gustavo has made a Master about the parallelization of a MPI version of Simulated Annealing.
- **Elton Mathias** — Master (2006 - 2008)
Elton has been working on the use of MPI on a Grid, managed by the middleware "Proactive" :<http://proactive.inria.fr>. He is currently in Nice, France, within the INRIA project called OASIS.
- **Marcelo Veiga** — Master (2006 - 2009)
Marcelo has concluded his Master on the use of process migration in MPI programs. He has used both virtual machines and OpenMPI in order to enable the process migration.
- **João Lima** — Master (2007 - 2008)
João is working on the control of the granularity in MPI programs, that create tasks at run-time. They can be mapped either to heavy processes, either to lightweight threads. To that end, he has re-implemented part of MPI_Comm_spawn in MPI-CH.
- **Stéfano Drimon Kurz Mor** — Master (2008 - 2009)
Stéfano has done a Master on the use of Work-Stealing in MPI-2.
- **Fernando Afonso** — Master (2008 - 2010)
Fernando is doing a Master on the use of Object-Orientation with MPI.
- **Cristian Castañeda** — Master (2009 - 2010)
Cristian is doing a Master about compilation and code refactoring for Fortran.
- **Alexandre Almeida** — Master (2009 - 2010)
Alexandre is doing a Master on Auto-Tuning in Parallel Domain Decomposition.
- **Bruno Gallina Apel** — Master (2010 - 2011)
Bruno is starting a Master about Object Oriented parallel programming.
- **Márcia C. Cera** — PhD (2006 - 2010)
Márcia is doing her PhD on the control of the different forms of dynamicity that can be met in a parallel program : at the application level, which can spawn new tasks ; at the platform level, where processing units can evolve with time. Márcia's work is co-supervised by the Prof. Philippe O. A. "Navaux" :<http://www.inf.ufrgs.br/navaux> (UFRGS) and Olivier "Richard" :<http://mescal.imag.fr> (LIG, Grenoble, France).
- **Claudio Schepke** — PhD (2008 - 2012)
After his master on the parallelization (with MPI) of a Lattice-Boltzmann method, Claudio has started his PhD on the use of parallel programming models that support the dynamic control of High-Performance Computing applications.
- **João Lima** — PhD (2010 - 2014)
After his Master, João has started a PhD (in collaboration with the project MOAIS of the "LIG" :<http://www.liglab.fr>) on the parallel programming of hybrid architectures, for instance CPUs and GPUs.
- **Stéfano Drimon Kurz Mor** — PhD (2010 - 2014)
After his Master, Stéfano is starting a PhD on APIs for hybrid and dynamic parallel programming.

I participate to the following research projects, either with public or private funding.

International Projects

- **CAPA** (2008-2010) - CNPq-INRIA. *Coord. Philippe O. A. Navaux* – This project brings fundings to the common research with the Parallel Processing Group of Grenoble/LIG in High-Performance Computing.
- **GBRAMS-AMSUD** (2008-2009 OVER) - CAPES/INRIA (STIC-AMSUD). *Coord. Philippe O. A. Navaux* – This international project joins together Brazil (UFRGS), Argentina (UBA), Peru (Univ.of Trujillo) and France (project MESCAL/INRIA) to assemble a computational grid of four clusters among our countries, in order to simulate a twenty years climatology for the whole Southern America. The software OAR will be used to run the Grid.
- **Probral** (2007-2009 OVER) - CAPES-DAAD. *Coord. Nicolas Maillard / Ph. O. A. Navaux* – Sets up a collaboration with the German partners from the Technische Universität Berlin (TÜB) and the GPPD, besides Cesar A. F. De Rose's group (PUCRS, Brazil). The fields of interest are the management of Grids and Clusters, and parallel programming. Two Brazilian PhD students are currently spending one year of their studies in Berlin, within this project. The GPPD has received the visit of the PhD student Jörg Schneider, during 5 weeks in 2007. It is notable that the scientific collaboration with the group of the Prof. Heiss has also resulted in a UNIBRAL project, for under-graduate students exchange.
- **BRAFITEC Sistema** (2007-2008 OVER) - CNPq. *Coord. Philippe O. A. Navaux* – This project deals with students exchange, at the undergraduate level, with the universities of Grenoble (France). On our side, both our courses of Computer Engineering and Computer Science are involved. Each year, some 5 of our students are sent for two semesters to Grenoble, and we receive around 4 or 5 French students. The SCISTEMA project is the sequel of the former Brafitec project called Paginer (coord. : Prof. Geyer), which has worked on the same basis from 2003 to 2006. It is notable that this kind of interaction with Europe has started as an evolution of the other many research projects that have been going on for more than two decades.
- **Équipe Associée DIODE-A** (2006-2011) - INRIA. *Coord. Bruno Raffin* – The research group where I am working (GPPD has been chosen as GPPD in Dec., 2006. As a comparison, there are only two associated teams in Brazil, and 27 worldwide.
- **P(AD)²** (2006-2009 OVER) - CAPES-COFECUB. *Coord. Philippe O. A. Navaux* – Sets up a collaboration with the French INRIA projects called MOAIS and MOAIS with exchange of Master and PhD students. The main themes are Grid Computing, Parallel Programming (MPI, OpenMP, Kaapi) and distributed file-systems. Until now, two Brazilian PhD students have spent one year in France within P(AD)², and the GPPD has received 2 PhD students from Grenoble.
- **PICS** (2005-2007 OVER) - CNPq/CNRS. *Coord. Bruno Raffin* – This project has fostered the common research between the GPPD and the parallel computing group of Grenoble/LIG in High-Performance Computing (IO systems, Monitoring, Adaptive programming with MPI). The GPPD has received a counterpart budget from the CNPq, in 2007 (coord. : Prof. Philippe O. A. Navaux).

National Projects

- **Projeto Multicore** (2008-2009 OVER) - CNPq (Universal). *Coord. Philippe O. A. Navaux* – In partnership with the Profs. Navaux and Navaux this project consists in the study of the new parallel architectures and of how they can be programmed. The study has started with the support that reconfigurable architectures can provide to run efficiently PRAM programs. This project includes a PhD collaborator, two PhD students and three Master students.
- **Interoperability** (2007-) - Microsoft. *Coord. Philippe O. A. Navaux* – This project, in partnership with Roberto Prado (Microsoft), includes quite a few research lines under the supervision of four researchers from the UFRGS. I am responsible for the sub-project called MPI_‡, which deals with the integration of MPI and C_‡. I am also

supervising the work on a tool that compiles ODT documents into OpenXML ones. These two lines of work include two undergraduate students (one of them making his concluding work), and a Master student.

- **Massive Atmosphere** (2007-2008 OVER) - CNPq (Grandes Desafios). *Coord. Philippe O. A. Navaux* – Together with the CPTEC (Dr. Jairo Paneta) and the CPTEC (Prof. Pedro Dias), we are working in this project on the study of the impact of Multicore architectures in the performance of the parallel programs (using MPI and/or OpenMP) that are used to model and forecast the weather and the climate in Brazil. These software include BRAMS and OLAM.
- **RECLIRS** (2007-2009 OVER) - FINEP (Redes Estaduais). *Coord. Haroldo Fraga dos Campos Velho* – This project is a regional offspring of the GBRAMS project, local to the state Rio Grande do Sul. Together with the colleagues from meteorology and hydrology (IPH/UFRGS), and also with groups from Pelotas, from the INPE/Santa Maria and from the Federal University of Santa Maria, we are simulating the evolution of the climate in our state.
- **Curriculum for the Intel Multi-core technology** (2006-2007 OVER) - INTEL. *Coord. Philippe O. A. Navaux* – Has dealt with the programming of Multicore architectures. The aim was to foster the teaching of the technology and its programming tools (OpenMP and MPI). We have provided lectures, and the setup of a laboratory of 10 dualcores PCs, besides some talks in national events. The project has also involved the Prof. Carissimi and two PhD students.
- **G-BRAMS** (2005-2007 OVER) - FINEP. *Coord. Philippe O. A. Navaux* – This project has dealt with the use of a Computational Grid, in collaboration with the partners from the INPE (LAC e CPTEC), in order to test such a platform with a production-like software of climatological simulation, called BRAMS. BRAMS is based on MPI. Three middleware for Grid computing have been compared : Globus, OurGrid and INPE This project has also had the support of HP Brazil.
- **JAVA-WSPAD** (2005-2007 OVER) - FINEP. *Coord. Philippe O. A. Navaux* – In partnership with Prof. "Claudio Amorim" :www.cos.ufrj.br/~amorim, from the COPPE (Univ. Federal do Rio de Janeiro). This project has focused on the use of Web Services to set up a cluster of clusters and unify the management tools (job submission, batch scheduler, monitoring, etc.). Two other researchers of the GPPD have worked on this project, besides 3 graduate students. The project has counted with the support of HP Brazil.
- **CLUMSSY** (2004-2006 OVER) - HP Brasil. *Coord. Philippe O. A. Navaux* – In this project, I have led the research on scheduling of parallel, MPI programs. We have done it in two contexts : statically (off-line), by using the communication graph of a former execution to map the processes to the processors; and dynamically, by spawning new processes at run-time to balance the load.

PUBLICATIONS

- Journals
 - Lima, Joao V.F. and Maillard, Nicolas : *Online mapping of MPI-2 dynamic tasks to processes and threads*. In International Journal of High Performance Systems Architecture (Print). Vol. 2, . pp. 81–89. 2009
 - Schepke, Claudio and Navaux, Philippe O. A. and Maillard, Nicolas : *Parallel Lattice Boltzmann Method with Blocked Partitioning*. In International Journal of Parallel Programming. Vol. 37, 1. pp. 593–611. 2009
 - Richard, Bruno and Rose, César A F de and Novaes, Reynaldo and Maillard, Nicolas : *The I-Cluster Cloud : Distributed Management of Idle Resources for Intense Computing*. In Parallel Computing. Vol. 31, . pp. 813–838. 2005
 - Jeannerod, Claude Pierre and Maillard, Nicolas : *Using Computer Algebra to Diagonalize some Kane Matrices*. In Journal of Physics. A, Mathematical and General. Vol. 33, . pp. 2857–2870. 2000
- Conferences
 - Cera, Márcia Cristina and Georgiou, Y. and Richard, O. and Maillard, N. and Navaux, Philippe Olivier Alexandre : *Supporting Malleability in Parallel Architectures with Dynamic CPUSets Mapping and Dynamic MPI*. In Distributed Computing and Networking : 11th International Conference, ICDCN 2010. Springer Verlag. pp. 242–257. 2010
 - Ruztig, M. and Madruga, F. and Z, Alvez. M. A. and Cotas, H. and Beck, A. C. and Maillard, N. and Navaux, Philippe O. A. and Carro, L. : *TLP and ILP exploitation through Reconfigurable Multiprocessing System*. In Proceedings of IPDPS 2010. . pp. -. 2010
 - Mor, S. D. K. and Maillard, N. : *Melhorando o Desempenho de Algoritmos do Tipo Branch & Bound em MPI via Escalonador com Roubo Aleatório de Tarefas*. In X Simpósio em Sistemas Computacionais. SBC. pp. 11–18. 2009
 - Schneider, J. and Gerd, J. and Heiss, H. U. and Ferreto, T. and Rose, César A F de and Righi, Rodrigo da Rosa and Rocha, E. and Maillard, Nicolas and Navaux, Philippe Olivier Alexandre : *Design of a Grid Workflow for a Climate Application*. In Proceedings of ISCCÁ'09. . pp. -. 2009
 - Traoure, D. and Roch, Jean Louis and Maillard, Nicolas and Gautier, T. and Bernard, J. : *Deque-Free Work-Optimal Parallel STL Algorithms*. In Proceedings of EUROPARÁ'08. Springer. pp. 887–897. 2008
 - Lima, J. V. F. and Maillard, Nicolas : *Controle da Granularidade com Threads em Programas MPI Dinâmicos*. In IX Simpósio em Sistemas Computacionais - WSCAD-SSC 2008. SBC. pp. 125–133. 2008
 - Veiga, M. and Righi, Rodrigo da Rosa and Maillard, Nicolas and Navaux, Philippe Olivier Alexandre : *Impacto da Migração de Máquinas Virtuais de Xen na Execução de Programas MPI*. In VIII Workshop em Sistemas Computacionais de Alto Desempenho. . pp. 45–52. 2007
 - Pezzi, Guilherme Peretti and Cera, Márcia Cristina and Mathias, Elton Nicoletti and Maillard, Nicolas and Navaux, Philippe Alexandre Olivier : *On-Line Scheduling of MPI-2 Programs with Hierarchical Work Stealing*. In 19th International Symposium on Computer Architecture and High Performance Computing. IEEE Computer Society. pp. 247–254. 2007
 - Mathias, Elton Nicoletti and Baude, F. and Cave, V. and Maillard, Nicolas : *A Component-Oriented Support for Hierarchical MPI Programming on Multi-Cluster Grid Environments*. In 19th International Symposium on Computer Architecture and High Performance Computing. IEEE Computer Society. pp. 135–142. 2007
 - Souto, R. P. and Ávila, Rafael Bohrer and Navaux, Philippe Alexandre Olivier and Py, M. and Maillard, Nicolas and Diverio, Tiaraju Asmuz and Velho, Haroldo Fraga de Campo and Stephany, S. and Preto, A. and Panetta, Jairo and Rodrigues, E. and Almeida, E. : *Processing Mesoscale Climatology in a Grid Environment*. In Proceedings of CCGRID'07.. IEEE Computer Society. pp. 363–370. 2007
 - Schepke, C. and Maillard, Nicolas : *Performance Improvement of the Parallel Lattice Boltzmann Method*. In 19th International Symposium on Computer Architecture and High Performance Computing. IEEE Computer Society. pp. 71–78. 2007
 - Marquezan, Clarissa and Navaux, Philippe Olivier Alexandre and Schnorr, Lucas Mello and Righi, Rodrigo da Rosa and Maillard, Nicolas and Carissimi, Alexandre da Silva : *ICE : A Service Oriented Approach to Uniform Access and Management of Cluster Environments*. In Proceedings of CCGRID'06. IEEE Computer Society. pp. 1–8. 2006

- Velho, Haroldo Fraga de Campo and Preto, A. and Stephany, S. and Rodrigues, E. and Panetta, Jairo and Almeida, E. and Souto, R. P. and Navaux, Philippe and Diverio, Tiaraju and Maillard, Nicolas and Dias, Pedro Leite da Silva : *Grid Computing for Mesoscale Climatology : Experimental Comparison of Three Platforms*. In *vecpar'06 : 6th International Conference on High Performance Computing in Computational Sciences*. . pp. 1–6. 2006
- Righi, Rodrigo da Rosa and Schnorr, Lucas Mello and Marquezan, Clarissa and Maillard, Nicolas and Carrissimi, Alexandre and Navaux, Philippe Olivier Alexandre : *Portal ICE - Uso de Web Services para Atingir Extensibilidade no Gerenciamento de Múltiplos Agregados*. In VII Workshop em Sistemas Computacionais de Alto Desempenho. . pp. 133–140. 2006
- Pezzi, Guilherme Peretti and Cera, Márcia Cristina and Mathias, Elton Nicoletti and Maillard, Nicolas and Navaux, Philippe Olivier Alexandre : *Escalonamento Dinâmico de programas MPI-2 utilizando Divisão e Conquista*. In VII Workshop em Sistemas Computacionais de Alto Desempenho. SBC. pp. 71–78. 2006
- Cera, Márcia Cristina and Pezzi, Guilherme Peretti and Pilla, Maurício and Maillard, Nicolas and Navaux, Philippe : *Scheduling Dynamically Spawned Processes in MPI-2*. In *Job Scheduling Strategies for Parallel Processing, 12th International Workshop, JSSPP 2006*. Lecture Notes in Computer Science, Springer. pp. 33–45. 2006
- Cera, Márcia Cristina and Pezzi, Guilherme Peretti and Matthias, Elton Nicoletti and Maillard, Nicolas and Navaux, Philippe Olivier Alexandre : *Improving the Dynamic Creation of Processes in MPI-2*. In *Recent Advances in Parallel Virtual Machine and Message Passing Interface*. Springer. pp. 247–255. 2006
- Silva, Rafael Ennes da and Maillard, Nicolas and Pezzi, Guilherme Peretti and Diverio, Tiaraju : *Automatic Data-Flow Graph Generation of MPI Programs*. In *17th Symposium on Computer Architecture and High Performance Computing*. IEEE Computer Society. pp. 93–100. 2005
- Beaumont, Olivier and Daoudi, El Mostafa and Maillard, Nicolas and Manneback, Pierre and Roch, Jean Louis : *Tradeoff to minimize extra-computations and stopping criterion tests for parallel iterative schemes*. In *Proceedings of PMAA'04*. . pp. –. 2004
- Maillard, Nicolas and Daoudi, El Mostafa and Manneback, Pierre and Roch, Jean Louis : *Contrôle amorti des synchronisations pour le test d'arrêt des méthodes itératives*. In *14èmes rencontres francophones du parallélisme*. . pp. 177–182. 2002
- Rose, César A F de and Blanco, F. and Maillard, Nicolas and Saikoski, K. and Novaes, Reynaldo and Richard, O. and Richard, Bruno : *The Virtual Cluster : a Dynamic Environment for Exploitation of Idle Network Resources*. In *14th symposium on Computer Architecture and High-Performance Computing (SBAC-PAD 2002)*. IEEE Computer Society. pp. 141–148. 2002
- Fernandes, L. G. and Maillard, Nicolas and Denneulin, Y. : *Parallelizing a Dense Matching Region Growing Algorithm for an Image Interpolation Application*. In *Proceedings of the International Conference on Parallel and Distributed Techniques and Applications*. . pp. 491–495. 2001
- Jeannerod, Claude Pierre and Maillard, Nicolas and Pfluegel, Eckhard : *An Algorithmic Approach for the Symmetric Perturbed Eigenvalue Problem - Application to the solution of the Schroedinger Equation by a kp-perturbation method*. In . . pp. –. 1998
- Maillard, Nicolas and Roch, Jean-Louis and Valiron, Pierre : *Parallélisation du Calcul ab-initio de l'énergie électronique par la méthode MP2*. In *RenPar'9 - 9èmes rencontres francophones du parallélisme*. André Schiper, Denis Trystram. pp. 45–49. 1997