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Maried
3 children
Nationality: French
Birthdate: February 6th 1978

PhD

High Performance Computing and Graphics

Education

- 2009 - 2014 • Engineer in **High Performance Computing** and **Scientific Visualization** at IPP¹
- 2007 - 2009 • INRIA² engineer in **Numerical Simulation** at IRMA³
- 2006 - 2007 • Post-doc in **Scientific Visualization** at IRMA³
- 2002 - 2006 • PhD in **High Performance Computing** and **Scientific Visualization** at LSIT⁴
- 2001 - 2002 • Computer science master at University of Strasbourg (France)
- 1998 - 2001 • Engineer diploma in microelectronic and automatic from Polytech'Montpellier (France)

¹ Max Planck Institute for Plasma Physics

² French National Institute For Research in Computer Science and Control

³ Institute of Mathematics of the University of Strasbourg, France

⁴ Image Sciences, Computer Sciences and Remote Sensing Laboratory, Strasbourg France

Job Experience

Software Engineering

- INRIA engineer
 - Desgin of numerical simulation platform
 - Standardisation and reuse of INRIA CALVI project simulation codes
 - Automatic validation and comparison
 - ⇒ **Significant time reduction for numerical scheme implementation**
- INRIA engineer
 - European project Euforia: contribution to software infrastructure of the european fusion scientific community (EFDA-ITM)
 - Software adaptation of VisIt to fusion data format
 - Development of a d'un module Python to access fusion datasets
 - Integration of my PhD work on 4D visualization to physicist's tools
 - ⇒ **Contribution to the post-processing part of the infrastructure**

High Performance Computing

- PhD
 - Vlasov-Poisson system numerical resolution
 - Simulation on adaptive grids
 - Use of wavelets
 - Simulation parallelization
 - ⇒ **Adaptive parallel code for Vlasov-Poisson system resolution**
- IPP engineer
 - MPI libraries evaluation on Petaflop computer IFERC-CSC (70560 cores)
 - Exhaustive study of the All_to_All communication pattern on different architectures: Bluegene/Q, Cray XE6, IBM iDataplex, Bull B510 blade system and up to 64k MPI tasks

Job Experience (continued)

- Porting of a parallel application on Intel Xeon Phi architecture
- Comparison of different methods for performing parallel IO

Scientific Visualization

- PhD
- Multidimensional visualisation of functions $f : \mathbb{R}^4 \rightarrow \mathbb{R}$
 - Large datasets
 - Data compression
 - Real time decompression for visualization
⇒ **Design of a 4D visualization software (plasmaViz)**
- Post-doc
- Parallel export of large 4D datasets
 - Code coupling : parallel simulation - visualization
⇒ **Algorithms and data structures integration into VisIt**
- IPP engineer
- Support and collaboration with physicists on post-processing and visualization strategies

Virtual Reality

- Master
- Development of an immersive geological application
 - Human-computer interaction

Teaching

- PhD
- Object oriented design and programming
 - Algorithms and C, java language
 - Operating systems
 - Computer architecture
⇒ 300 hours teaching
- IPP engineer
- Python/post-processing training (2 days)
 - HDF5/post-processing training (4 days)

Skills

Computer science

- Very good knowledge and practise C, C++, Python, Fortran90 languages
 - Other languages : java, XML, XSL, shell, L^AT_EX
 - Libraries
- Graphics : OpenGL, OpenInventor, VTK
- User Interface : Qt
- Data storage : HDF5, silo
- Parallelization : OpenMP, MPI
- Python Packages : Scipy, numpy, matplotlib, f2py, Swig
- Softwares : VisIt, paraView
 - Systems : Linux, Unix

Mathematics

- Wavelet data compression
- Numerical analysis notions

Skills (continued)

Languages

- French: native speaker
- English: fluent both spoken and written
- German: fluent spoken and notion for writing

Publications

T. RIBEIRO, M. HAEFELE *Fourier filtering in NEMORB code and distributed matrix transposition on Petaflop systems*, to appear in International Conference on Parallel Computing - Munich (Allemagne) 2013

M. HAEFELE *Comparison of Different Methods for Performing Parallel I/O*, Technical report 2010, Max Planck edoc server ID: 498606.0

M. HAEFELE, L. KOS, P. NAVARRO, E. SONNENDRÜCKER. *Euforia Integrated Visualization*. Parallel, Distributed and Network-Based Processing - Pise (Italie) 2010.

M. HAEFELE, F. ZARA, G. LATU, J-M. DICHLER. *A dedicated Compression Scheme for Large Multidimensional Functions Visualization*. Workshop on Super Visualization - Kos (Greece) 2008.

M. HAEFELE, G. LATU, M. GUTNIC. *A parallel Vlasov solver using a Wavelet based Adaptive Mesh Refinement*. Workshop on High Performance Scientific and Engineering Computing - Oslo (Norway) 2005.

M. GUTNIC, M. HAEFELE, I. PAUN, E. SONNENDRÜCKER. *Vlasov simulations on an adaptive phase-space grid*. Computer Physic Communication, 164, 214-219, 2004.

E. SONNENDRÜCKER, M. GUTNIC, M. HAEFELE, G. LATU, and J.L. LEMAIRE. *Vlasov simulation of beams and halo*. Particule Accelerator Conference - Knoxville (U.S.A.) 2005.

M. GUTNIC, M. HAEFELE and E. SONNENDRÜCKER. *Moments conservation in adaptive Vlasov solver*. International Computational Accelerator Physics Conference - St Petersburg 2004.

E. SONNENDRÜCKER, M. GUTNIC, M. HAEFELE and J.L. LEMAIRE. *Adaptive Vlasov simulations of intense beams*. International Committee for Future Accelerators - Bensheim (Germany) 2004.

S. BRANDEL, M. HAEFELE, D. BECHMANN. *A geological application in interactive immersive virtual environments*. Virtual Reality International Conference - Laval (France) 2003.

Other

- Practice of **tai ji chuan** (internal martial art)
- President of a **student association** in 1999
- **Volley-ball** player from 1991 to 2006 (national 3 championships in 2006)