

# Curriculum Vitae

Johan Steensland

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## Personal Data

**Name:** Johan Steensland      **Address:** Advanced Software Research & Development  
**Born:** June 29, 1963      Sandia National Laboratories, MS 9915  
**Civil status:** Married      P.O. Box 969, Livermore, CA 94551-9915  
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## Exams etc.

**Ph D:** 2002, Scientific computing  
**Ph Lic:** 2001, Numerical analysis.  
**MSc:** 1997, Computer science, mathematics.  
**Senior High School:** 1993, Graduated from courses in mathematics, physics and English with top grade (5) in all courses.

## Employments

**Technical Staff**, Sandia National Laboratories      August 2005–  
**Post Doctoral Researcher**, Sandia National Laboratories      March 2003–August 2005  
**Ph D Student**, Uppsala University      July 1997– Feb 2003  
**High performance computing consultant**, Axon IT      Feb 1999–2000  
**Recording engineer**, Studio Pärla      1986–1988  
**Project leader**, Aktiv Ungdom (supporting young musicians)      1985-1986  
**Head of mail-order section**, Lelles (a motor cycle dealer)      1983-1984

## Stipends, Awards, and Nominations

Stipend/Award/Nomination	Purpose	Date
Nominated and accepted	Presentation at BASCD 2005, San Francisco, CA, USA	March 2005
Best Paper Award	PDCS2003, Marina Del Ray, CA	Fall 2003
Rutgers, stipend	Research visit, Rutgers University, New Jersey	Spring 2002
Uppsala University, stipend	Research visit, Rutgers University, New Jersey	Spring 2001
Ericsson, stipend	Research visit, Rutgers University, New Jersey	Spring 2001
KVA, stipend	Research visit, Rutgers University, New Jersey	Spring 2001
Rutgers, stipend	Research visit, Rutgers University, New Jersey	Spring 2001
Best Research Poster Award	Super Computing 2000	Fall 2000
Rutgers, stipend	Research visit, Rutgers University, New Jersey	Spring 2000
Ericsson, stipend	Research visit, Dept of Engineering and Computer Science, University of California, San Diego, and	
	Conference, Irregular99, San Juan, Puerto Rico	Spring 1999
ISS90, stipend	Conference, Irregular98, Berkeley, California	Summer 1998

## Oral Presentations

Conference presentation, SIAM PP06, San Francisco, CA, USA	February 2006
Invited talk, CCT, Louisiana State University, Baton Rouge, LA, USA	August 2005
Conference presentation, IPDPS/PDSEC05, Denver, CO, USA	April 2005
Invited talk, Bay Area Scientific Computing Day 2005, San Francisco, CA, USA	March 2005
Conference presentation, SIAM SC&E, Orlando, FL, USA	February 2005
Invited talk, Sandia National Laboratories, NM	December 2004
Dean Seminar, Sandia National laboratories, CA	November 2004
Conference presentation, HPSEC04, Montreal, Canada	August 2004
Project meeting presentation, CACR, Caltech, California, USA	July 2004
Conference presentation, SIAM PP04, San Francisco, CA, USA	February 2004
Conference presentation, PDCS03, Marina Del Rey, CA, USA	November 2003
Conference presentation, LACSI03, Santa Fe, NM, USA	October 2003
Invited talk, Ume University, Dept of Computing Science	Feb 2003
Post-doc interview presentation at Sandia California, USA	May 2002
2002 CAIP Colloquia Series, Rutgers University, New Jersey	May 2002
Invited talk at CACR, Caltech, California, USA	August 2001
Invited talk at Sandia National Labs, New Mexico, USA	August 2001
Seminar at TASSL, Rutgers University, New Jersey, USA	April 2001
Licentiate seminar, Dept. of Scientific Computing, Uppsala University, Sweden	March 2001
Conference presentation, PARA2000, Bergen. Norway	July 2000
Seminar at TASSL, Rutgers University, New Jersey, USA	May 2000
Seminar at TASSL, Rutgers University, New Jersey, USA	March 2000
Seminar at TASSL, Rutgers University, New Jersey, USA	Fall 1999
Seminar at Dept of Scientific Computing	Spring 1999
Seminar at Dept. of Engineering and Computer Science, University of California, San Diego, USA	Spring 1999
Research presentation at <i>Informal workshop for the Industrial Computational Mathematics program within NTM</i>	Fall 1998
Research presentation at <i>A Day of Research</i> at the Department of Scientific Computing, Uppsala University, Sweden.	Spring 1998

## Research Qualifications

Johan Steensland's research concerns improving the scalability of scientific adaptive applications. He is specializing in partitioning of structured dynamic grid hierarchies occurring in the context of parallel adaptive mesh refinement applications, but he is generalizing his concepts to be applicable for general adaptive codes. In this research effort he has established collaborations with Professor Parashar at Rutgers, the State University of New Jersey, Professors Thuné and Rantakokko at Uppsala University, Sweden, researchers Deiterding at the California Institute of Technology, and Devine at Sandia National Laboratories, New Mexico. He works with senior staff member Jaideep Ray at Sandia, California. References to his research appear at the end of this document.

Johan earned his PhD from Uppsala University in December 2002. He is frequently requested to review scientific papers concerning parallel and scientific computing and he participates in numerous scientific conferences.

In Fall 2003 Johan with co-author Jaideep Ray received the "Best Paper Award" in the area of "Dynamic run-time environments" at The 15th IASTED International Conference Parallel and Distributed Computing and Systems 2003 (PDCS 2003). In Fall 2001, Johan with co-authors Sumir Chandra and Manish Parashar received the award for best research poster at the conference Super Computing 2001.

Upon invitation, Johan presented his research at The Bay Area Scientific Computing Day in San Francisco and at Louisiana State University in 2005, at Sandia National Laboratories in New Mexico in 2004, and at California Institute

of Technology (Caltech) and Sandia National Laboratories in New Mexico in Summer 2001.

During Spring 2000 Johan received a stipend from Rutgers University in New Jersey, and spent five months there at TASSL, working on dynamic partitioning with Prof. Manish Parashar. In April 2001, he returned to Rutgers for a six-week follow up on that research. Steensland received a stipend from Rutgers 2002 for a six-month stay working with Prof. Parashar there on the next generation partitioners for SAMR applications.

During Spring 1999 Johan Steensland received a grant for spending a month at University of California, San Diego, working on dynamic load balancing.

Johan's undergraduate thesis was part of a research project at Centre for Image Analysis. The work, *Interactive Gamut Mapping*, addressed differences between colors on computer screens and on paper printouts, and involved literature studies as well as development of new algorithms and methods.

## **Pedagogical Qualifications**

Johan Steensland has since fall 2003 been a formal supervisor of PhD student Henrik Johansson at Uppsala University in Sweden, and has formulated the better part of Henrik's PhD project. Henrik is scheduled to defend his PhD thesis in 2008.

Johan lectured with partial responsibility between spring 1997 and spring 1998. Between fall 1998 and fall 2003, he lectured with full responsibility. The courses were undergraduate courses in computer science, both at advanced and introductory level. In all cases, Johan contributed to updating the courses with new exams, assignments etc. For the course *Algorithms for Parallel Computers*, he was responsible for a significant development, giving the course largely new contents and structure. In connection to this, a substantial amount of new course material was produced.

The course evaluations have been positive. In *Algorithms for Parallel Computers*, Johan received on average 4.25 out of 5 in the category "Pedagogic skills" fall 1998. In Fall 1999, it was even a bit higher.

The courses *Oral presentation in English* and *Basic course in Pedagogics* were taken spring 1998 and fall 1998, respectively.

Johan Steensland participated in the *Socrates project*, aiming at developing the student and teacher exchange program, as well as establishing co-ordinated course development. At a meeting fall 1998 at INP-ENSEEIH in Toulouse, France, it was decided that he should give some lectures there, fall 1999 or the year 2000. At a meeting fall 1999 in Bergen Norway, it was decided he should give some lectures there as soon as possible.

## **Graduate courses**

Analysis of numerical methods 5 cp, Adaptive methods 5 cp, Literature studies adaptive methods 3 cp, Data parallel numerical algorithms 5 cp, Numerical linear algebra 4 cp, Distribution of computational grids 5 cp, Basic course in pedagogics 2 cp, Advanced parallel computer architectures 5 cp, Advanced numerical methods, overview 3 cp, Iterative methods 3 cp, Research ethics 5 cp, Neural networks 5 cp, Software support for implementing parallel SAMR 5 cp, The GRID 5 cp.

## **Miscellaneous**

Johan Steensland lives in Livermore, California with his family; his wife Pia and their sons Sebastian and Marcus. He has released a jazz/pop/soul album "do dem slow songs", which received great reviews and dubbed him "artist of the week" in Swedish Radio P4. Johan and his wife like landscape photography, preferably in Zion national park, the Sierra Nevada and the Rocky Mountains. He also bikes, swims, and works out on the speed bag.

## **Theses, Papers, Presentations, and Book Chapters**

[27] Johan Steensland, A hybrid and flexible data partitioner for parallel SAMR, book chapter, *Advanced Computational Infrastructures for Parallel and Distributed Adaptive Applications*, Wiley Book Series on Parallel and Distributed

Computing, to appear 2006.

[26] Lois Curfman McInnes, Jaideep Ray, Rob Armstrong, Tamara L. Dahlgren, Allen Malony, Boyana Norris, Sameer Shende, Joseph P. Kenny, and Johan Steensland, Computational Quality of Service for Scientific CCA Applications: Composition, Substitution, and Reconfiguration, Technical report, Argonne national laboratories, ANL-P1326, 2006.

[25] Henrik Johansson, and Johan Steensland, A Performance Characterization of Load Balancing Algorithms for Parallel SAMR Applications, Technical report 2006-047, Uppsala University, Information technology, To appear Fall 2006.

[24] Johan Steensland, Jaideep Ray, Henrik Johansson, and Ralf Deiterding, An improved bi-level algorithm for partitioning dynamic structured grid hierarchies, Sandia technical report, SAND-2006-2487, May 2006.

[23] Johan Steensland, Jaideep Ray, and Ralf Deiterding, An improved bi-level algorithm for partitioning dynamic structured grid hierarchies, Presentation at the SIAM Parallel Processing for Scientific Computing 2006 conference, San Francisco, California.

[22] Johan Steensland, Irregular buffer-zone partitioning reducing synchronization cost in SAMR, International Journal of Computational Science and Engineering (IJCSE), InderScience Publishers, special issue, to appear 2006.

[21] Johan Steensland and Jaideep Ray, A Partitioner-Centric Model for SAMR Partitioning Trade-Off Optimization: Part I, The International Journal of High Performance Computing Applications, Sage Publications, Volume 19 (2), pp 1–14, Summer 2005.

[20] Johan Steensland, Irregular buffer-zone partitioning reducing synchronization cost in SAMR, In the proceedings of The 6th Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC-05) held in conjunction with The 19th International Parallel and Distributed Processing Symposium (IPDPS-05), 2005. **One of the 7 out of 22 papers selected to appear as full papers in a special issue of The International Journal of Computational Science and Engineering (IJCSE).**

[19] Johan Steensland and Jaideep Ray, Using run-time state to improve scalability of SAMR applications, Presentation at the SIAM SC&E 2005 Conference, Orlando, Florida.

[18] Henrik Johansson and Johan Steensland, A Characterization of a Hybrid and Dynamic Partitioner for SAMR Applications, Technical Report 2004-009, Department of Information Technology, Uppsala University, Sweden, 2004.

[17] Henrik Johansson and Johan Steensland, A Characterization of a Hybrid and Dynamic Partitioner for SAMR Applications, In the proceedings of 16th IASTED International Conference Parallel and Distributed Computing and Systems 2004 (PDCS 2004), Acta Press.

[16] Johan Steensland and Jaideep Ray, A Partitioner-Centric Model for SAMR Partitioning Trade-Off Optimization: Part II, Sandia Technical Report, SAND-2003-8725, January 2004.

[15] Johan Steensland and Jaideep Ray, A Partitioner-Centric Model for SAMR Partitioning Trade-Off Optimization: Part II, To appear in the proceedings of The 6th International Workshop on High Performance Scientific and Engineering Computing (HPSEC-04), held in conjunction with The 2004 International Conference On Parallel processing (ICPP-04), in Montreal, Canada, Aug. 15-18, 2004.

[14] Johan Steensland and Jaideep Ray, Partitioning dynamic structured grid hierarchies, Presentation at the SIAM Conference on Parallel Processing for Scientific Computing in San Francisco, CA, Feb, 2004.

[13] Johan Steensland and Jaideep Ray, A Partitioner-Centric Model for SAMR Partitioning Trade-Off Optimization: Part I, In the Proceedings of The Fourth Los Alamos Computer Science Institute Symposium 2003 (LACSI 2003) on CD-Rom.

[12] Johan Steensland and Jaideep Ray, A Heuristic Re-Mapping Algorithm Reducing Inter-Level Communication in SAMR Applications, In the Proceedings from the 15th IASTED International Conference Parallel and Distributed Computing and Systems 2003 (PDCS 2003), volume 2, pages 707–712, 2003. **Received a Best Paper Award.**

[11] Johan Steensland and Jaideep Ray, A Heuristic Re-Mapping Algorithm Reducing Inter-Level Communication in SAMR Applications, Technical report, Sandia National Laboratories, CA, SAND-2003-8310, June 2003.

[10] Johan Steensland, Efficient partitioning of structured dynamic grid hierarchies, Ph D thesis 2002, Uppsala University, IT, Dept of Scientific Computing, Uppsala, Sweden. Uppsala dissertations from the faculty of science and

technology 44.

[9] Johan Steensland, Sumir Chandra and Manish Parashar, An Application-Centric Characterization of Domain-Based Inverse Space-Filling Curve Partitioners for Parallel SAMR Applications. *IEEE Transactions on Parallel and Distributed Systems*, IEEE Computer Society Press, Vol. 13, No. 12, pp. 1275-1289, December 2002.

[8] Sumir Chandra, Johan Steensland, Julian C Cummings and Manish Parashar, An experimental study of adaptive application sensitive partitioning strategies for SAMR applications. In proceedings of *LACSI Symposium 2001*, (Los Alamos Computer Science Institute) (12 pages on CD-Rom) October Santa Fe, NM, USA.

[7] Sumir Chandra, Johan Steensland and Manish Parashar, An experimental study of adaptive application sensitive partitioning strategies for SAMR applications. Presented at *Super Computing 2001 (SC2001)*. **Judged as Best Research Poster**

[6] Johan Steensland, Domain-based partitioners for parallel SAMR applications. Licentiate thesis 2001-002 in IT series, Uppsala University, IT, Dept of Scientific Computing, Uppsala, Sweden.

[5] Johan Steensland, Dynamic structured grid hierarchy partitioners using inverse space-filling curves. Technical Report 2001-002, Uppsala University, IT, Dept of Scientific Computing, Uppsala, Sweden. 2001.

[4] Johan Steensland, Michael Thuné, Sumir Chandra and Manish Parashar, Characterization of Domain-Based Partitioners for Parallel SAMR Applications. In *Proceedings of Parallel and Distributed Computing and Systems (PDCS2000)*, volume 2, pages 425-430, ACTA Press. 2000.

[3] Johan Steensland, Michael Thuné, Sumir Chandra and Manish Parashar, Towards an adaptive meta-partitioner for SAMR applications. Submitted to SC2000, May 2000.

[2] Johan Steensland, Stefan Soderberg, and Michael Thuné, Comparison of dynamic load balancing techniques for a parallel SAMR algorithm. In *Proceedings of PARA2000, Workshop on Applied Parallel Computing*, volume 1947 of LNCS, Springer Verlag.

[1] Johan Steensland, Interactive Gamut Mapping. Undergraduate thesis nr. 32 Centre for Image Analysis, June 1997.