

Gabriel Tanase

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Education

Ph.D. Candidate in Computer Science, Texas A&M University. Expected December 2009
Advisors: Lawrence Rauchwerger and Nancy Amato.
Ph.D. Thesis: *Parallel Containers in STAPL (Standard Template Adaptive Parallel Library)*
Generic infrastructure to support the development of parallel and distributed data structures.

M.S. in Computer Science, Polytechnic University of Bucharest, Romania, 1999-2000
Advisor: Irina Athanasiu.
10/10 GPA. Advanced field of study in operating systems, distributed systems and parallel computing. Completed thesis and project on *Parallel Algorithms for STAPL*.

B.S. in Computer Science, Polytechnic University of Bucharest, Romania, 1994-1999
9.85/10 GPA. Completed thesis and project on *Adaptive Parallelism using TupleSpace*.

Research Interests

Parallel Programming Languages and Libraries
Parallel Data Structures and Algorithms.
Programming Languages, Generic Programming and Compilers.

Experience

Research Assistant, Parasol Lab, Texas A&M University, September 2000 - present
Ph.D. research focused on Standard Template Adaptive Parallel Library (STAPL), a C++ parallel programming library for distributed and shared memory systems. Contributed to the design of the overall library including parallel programming model, runtime, parallel algorithms and data structures. Proposed, implemented and evaluated a framework for easy development of **parallel and distributed data structures (pContainers)** starting from existing sequential data structures. Evaluated the scalability of STAPL pContainer methods and parallel algorithms, on large clusters using up to 12000 processors.

Developed parallel code for particle transport simulations using the STAPL infrastructure for a DOE and NSF funded project. Unified the code base for handling 2D and 3D space discretizations using generic programming techniques, added support for deformable geometries and researched parallel algorithms for finding strongly connected components in distributed directed graphs.

Graduate Teaching Academy Fellow, Texas A&M University, September 2008 - April 2009
Year-long Graduate Teaching Academy program consisting of a seminar series, class observation sessions and interactive workshops under the supervision of a faculty mentor.

Research Intern, IBM Thomas J. Watson Research Center, May 2006 - August 2006.
Worked on Hierarchically Tiled Arrays, a novel parallel data structure to help improve the programmability of multi processor machines.

Teaching Assistant, Department of Computer Science, Polytechnic University of Bucharest, September 1999 - June 2000

Helped with laboratory work, teaching and grading for “Distributed Systems” and “Parallel Algorithms” courses. Taught a lab covering multiprogramming mechanisms and C programming on Unix platforms (Solaris, Linux) for “Operating Systems” course.

Software Engineer (Part Time), Mediafax, Bucharest, Romania, March 1999 - March 2000

Developed a server/client application to send and display news.

Student Research Mentoring

Harshvardhan, PhD in CS major at Texas A&M University, 2009 - present.

Implemented sequential and parallel graph algorithms in STAPL.

Xiabing Xu, PhD in CS major at Texas A&M University, 2008 - present.

Implemented parallel list container in STAPL.

Jessie Berlin, Undergraduate CS major at Tufts University, Summer 2007.

Implemented and evaluated parallel sample sort in STAPL. Received honorable mention in the 2009 “CRA Outstanding Undergraduate Award” competition.

Chidambareswaran Raman, Masters in CS major at Texas A&M University, 2006-2007.

Implemented parallel associative containers in STAPL.

Tao Huang, Masters in CS major at Texas A&M University, 2003-2006.

Implemented a set of complex parallel algorithms in STAPL.

Anna Tikhonova, Undergraduate CS major at University of San Francisco, Summer 2005.

Completed the design and implementation of a complex parallel algorithm using STAPL. Currently in graduate school at UC Davis.

Olga Tkachyshyn, Undergraduate CS major at Western Oregon University, Summer 2003.

Designed and implemented a parallel array data structure for STAPL. Currently in graduate school at Texas A&M University. Awarded an NSF Graduate Research Fellowship.

Professional Service and Activities

Referee for IPDPS '10, SPAA '09, PPOPP '08, LCSD '07, ICPADS '07, HiPEAC '07, HiPC '07, SC '07, IPDPS '07, ICS '07, HIPS '07, IPDPS '06, ICS '06, LCPC '05, PPOPP '05, LCPC '04, LCPC '03, HiPC '03.

Member of ACM.

Refereed Publications in Conferences and Journals

- [1] Gabriel Tanase, Xiabing Xu, Antal Buss, Harshvardhan, Ioannis Papadopoulos, Olga Pearce, Timmie Smith, Nathan Thomas, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “The STAPL pList”, in *Proc. of the 22nd International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Newark, Delaware, Oct 2009.
- [2] Antal A. Buss, Timmie G. Smith, Gabriel Tanase, Nathan L. Thomas, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “Design for Interoperability in STAPL: pMatrices and Linear Algebra Algorithms”, in *Proc. of the 21st International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Edmonton, Alberta, Canada, July 2008. Published in *Lecture Notes in Computer Science (LNCS)*, **5335** Springer-Verlag, 2008, pp. 304-315.

- [3] Gabriel Tanase, Chidambareswaran Raman, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “Associative Parallel Containers in STAPL”, in *Proc. of the 20th International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Champaign, Illinois, Oct 2007. Published in *Lecture Notes in Computer Science (LNCS)*, **5234** Springer-Verlag, 2008, pp. 156-171.
- [4] Gabriel Tanase, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “The STAPL pArray”, in *Proc. of the 8th Workshop on MEMory performance: DEaling with Applications, systems and architecture (MEDEA 2007)*, Brasov, Romania, Sept 2007, pp. 81-88.
- [5] Ganesh Bikshandi, Jia Guo, Christoph von Praun, Gabriel Tanase, Basilio B. Fraguera, Maria J. Garzaran, David Padua, Lawrence Rauchwerger, “Design and Use of HTALib – a Library for Hierarchically Tiled Arrays”, in *Proc. of the 19th International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, New Orleans, Louisiana, Nov 2006. Published in *Lecture Notes in Computer Science (LNCS)*, **4382** Springer-Verlag, 2007, pp. 17-32.
- [6] Nathan Thomas, Steven Saunders, Timmie G. Smith, Gabriel Tanase, Lawrence Rauchwerger, “ARMI: A High Level Communication Library for STAPL”, in *Parallel Processing Letters*, **16**(2), 2006, pp. 261-280.
- [7] Nathan Thomas, Gabriel Tanase, Olga Tkachyshyn, Jack Perdue, Nancy M. Amato, Lawrence Rauchwerger, “A Framework for Adaptive Algorithm Selection in STAPL”, in *Proc. of ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*, Chicago, Illinois, June 2005, pp. 277-288.
- [8] Shawna Thomas, Gabriel Tanase, Lucia K. Dale, Jose E. Moreira, Lawrence Rauchwerger and Nancy M. Amato, “Parallel Protein Folding with STAPL”, *Concurrency and Computation: Practice and Experience*, **17**(14), 2005, pp. 1643-1656.
- [9] Ping An, Alin Jula, Silviu Rus, Steven Saunders, Timmie Smith, Gabriel Tanase, Nathan Thomas, Nancy M. Amato, Lawrence Rauchwerger, “STAPL: An Adaptive, Generic Parallel C++ Library”, in *Proc. of the 14th Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Cumberland Falls, KY, August 2001. Published in *Lecture Notes in Computer Science (LNCS)*, **2624** Springer-Verlag, 2003, pp. 193-208.
- [10] Ping An, Alin Jula, Silviu Rus, Steven Saunders, Timmie Smith, Gabriel Tanase, Nathan Thomas, Nancy M. Amato, Lawrence Rauchwerger, “STAPL : A Standard Template Adaptive Parallel C++ Library”, in *Proc. of the International Workshop on Advanced Compiler Technology for High Performance and Embedded Systems*, Bucharest, Romania, July 2001, pp. 37-46.

Publications under Submission

- [1] Gabriel Tanase, Antal Buss, Olga Pearce, Harshvardhan, Xiabing Xu, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “The STAPL Parallel Container Framework”.

Unrefereed Publications, Technical Reports and Posters

- [1] Gabriel Tanase, Christoph von Praun, Calin Cascaval, Lawrence Rauchwerger, “Arrays with Dynamic Hierarchical Tiling and their Applications”, Poster, IBM T.J. Watson Research Center, Aug 2006.
- [2] Anna Tikhonova, Gabriel Tanase, Olga Tkachyshyn, Nancy M. Amato, Lawrence Rauchwerger, “Parallel Algorithms in STAPL: Sorting and the Selection Problem”, Technical Report, TR05-005, Parasol Laboratory, Department of Computer Science, Texas A&M University, Aug 2005.

- [3] Olga Tkachyshyn, Ping An, Gabriel Tanase, Nancy M. Amato, “pArray as an efficient static parallel container in STAPL”, Technical Report, TR03-003, Parasol Laboratory, Department of Computer Science, Texas A&M University, Aug 2003.
- [4] Gabriel Tanase, “TupleSpace (©IBM), a framework for distributed applications”, in *PC Report*, Nr.93, 2000, Romania.

Technical Specialties

Platforms: Linux (Ubuntu, CentOS, RedHat, Rocks: 10+ years), AIX (2+ years), Windows (10+ years), MacOS X 10.* (2 years), Virtualization (VMware player, VirtualBox; 2+ years).

Languages: C++ (10+ years), Java (3 years), Visual C++ (2 years), Bash Programming (5 years), Matlab (1 year), HTML/CSS/JavaScript.

Tools: STL (10 years), MPI (5 years), Posix Threads, TBB, Boost (5 years), MTL (2 years), GCC, G++, GDB, Intel C++ Compilers, TotalView, PAPI, Valgrind, gprof, Visual Studio, SVN, CVS, Batch Systems (PBS, LoadLeveler), L^AT_EX, Microsoft Office (Word, Excel, PowerPoint), OpenOffice.

Hardware: Linux x86 Clusters, IBM p5-575 Clusters, Cray XT4, IBM BlueGene, SGI Altix 3700, IBM SP RS/6000.

Additional Information

Extracurricular: President of the Romanian Club at Texas A&M University (2004 – 2006).

Spoken Languages: English - fluent, Romanian - native speaker, French - beginner.

Work Authorization: International student authorized for Optional Practical Training (F1 visa).