

# HARSHVARDHAN

Parasol Laboratory  
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## EDUCATION

Texas A&M University, College Station, TX.

**Doctor of Philosophy** in Computer Science (2009 – 2014)

- Areas of Research: **Parallel/Distributed Systems, Parallel Graph Algorithms and Frameworks**
- **GPR: 3.7**
- Advisors: Prof. Nancy Amato and Prof. Lawrence Rauchwerger

Texas A&M University, College Station, TX.

**Bachelor of Science** in Computer Engineering, Dec 2008 (2005 – 2008)

Minor in Mathematics & Computer Science.

- **GPR (in Major): 4.0**; GPR (overall): **3.872, Magna-cum-Laude**
- **Ranked 1st** in class of 2008 (Computer Engineering)

## RELATED COURSE WORK

Undergraduate: Analysis of Algorithms, Computer Architecture, Microprocessor Design, Operating Systems.

Graduate: Advanced Compiler Design, Distributed Algorithms, Frontiers in Storage Systems, Networking, Programming Language Design, Parallel Algorithm Design, Internet-Scale Data Management.

## HONORS & AWARDS

- **IAMCS Graduate Fellow**, Institute for Applied Mathematics and Computational Sciences, TAMU (2011—2013)
- **Graduate Leadership Excellence Award**, Department of Computer Science & Engineering, TAMU (2013)
- **Mentoring Excellence Award**, Department of Computer Science & Engineering, TAMU (2011)
- **Bolton Scholarship** from Department of Electrical and Computer Engineering, TAMU (2005—2009)
- **Dean's List**, Dwight Look College of Engineering, TAMU (2007—2008)
- Selected as finalist for “**Outstanding Senior Engineer**”, Texas A&M University (2008)
- **Engineering Scholars Program Honors Certificate**, Dwight Look College of Engineering (2008)
- Research Proposal selected for University **Undergraduate Research Fellows** program (2007)
- Member of **Tau Beta Pi, Eta Kappa Nu, and Upsilon Pi Epsilon** Engineering Honor societies (2007)
- Won several prizes at numerous technical symposia and National Informatics Olympiad

## RESEARCH & WORK EXPERIENCE

Researcher, **PARASOL Laboratory**, Dept. of CSE, TAMU (Algorithms and Systems Group) (09/05 – Present)

- Designed and Implemented a high-performance graph library (SGL) scalable to 100,000+ cores
- Worked on development of Standard Template Adaptive Parallel Library (STAPL)
- Mentored several graduate & undergraduate students
- **Research Projects:** Parallel Graph Algorithms and Paradigms, Graph-processing Frameworks.

Software Engineer Intern, **Google Inc.** (Pregel Team, System Infrastructure Group) (05/13 – 08/13)

- Extended the BSP paradigm to provide a Generalized Messaging Model for Pregel
- Designed and Implemented Fault-Tolerant Generalized Messaging
- Used in production by Knowledge Graph Team, Google Maps, Google+.
- Implemented k-core algorithm in Pregel, used by YouTube Personalization team.

Software Engineer Intern, **Google Inc.** (Search Infrastructure Group) (05/08 – 08/08)

- Designed and Implemented Multi-Threaded Framework to enable Python Services for Search
- Worked on creating a Distributed Python Service in C++

- Top-Level Design & Verification of two next-generation ARM based Processors.
- Assembly verification of all RTL modules of Processor.

## PUBLICATIONS:

- Harshvardhan, Adam Fidel, Nancy M. Amato, Lawrence Rauchwerger, “**KLA: A New Algorithmic Paradigm for Parallel Graph Computations**”, in *Proc. of the 23<sup>rd</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT)*, Edmonton, Canada, Aug 2014.  
- Nominated for **PACT’s Best Paper Award**.
- Harshvardhan, Adam Fidel, Nancy M. Amato, Lawrence Rauchwerger, “**The STAPL Parallel Graph Library**”, in *Proc. of the 25<sup>th</sup> International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Tokyo, Sept 2012.
- Gabriel Tanase, Antal Buss, Adam Fidel, Harshvardhan, Ioannis Papadopoulos, Timmie Smith, Nathan Thomas, Xiabing Xu, Nedal Mourad, Jeremy Vu, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “**The STAPL Parallel Container Framework**”, in *Proc. of the ACM SIGPLAN Symposium on Principles and Practices of Parallel Programming (PPoPP)*, Texas, Feb 2011.
- Antal Buss, Adam Fidel, Harshvardhan, Timmie Smith, Gabriel Tanase, Nathan Thomas, Xiabing Xu, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “**The STAPL pView**”, in *Proc. of the 23<sup>rd</sup> International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, Texas, Oct 2010.
- Antal Buss, Adam Fidel, Harshvardhan, Timmie Smith, Gabriel Tanase, Nathan Thomas, Xiabing Xu, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “The STAPL pView”, Technical Report, Texas A&M University, 2010
- Antal Buss, Harshvardhan, Ioannis Papadopoulos, Olga Pearce, Timmie Smith, Gabriel Tanase, Nathan Thomas, Xiabing Xu, Mauro Bianco, Nancy M. Amato, Lawrence Rauchwerger, “**STAPL: Standard Template Adaptive Parallel Library**”, in *The 3rd Annual Haifa Experimental Systems Conference (SYSTOR)*, Haifa, Israel, May 2010.
- 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)*, Delaware, Oct 2009.
- Harshvardhan, S Mittal, K Bacon, O Pearce, C Raman, G Tanase, N Thomas, N Amato, L Rauchwerger, “**STAPL Graph Generator Library**”, Technical Report, Texas A&M University, 2006.

## STUDENTS MENTORED

- Majed Sahli, PhD, KAUST: Parallel Suffix-Trees & Applications to Genome Processing (Summer—Fall 2012)
- Razen AlHarbi, PhD, KAUST: Parallel Suffix-Trees & Applications to Genome Processing (Summer—Fall 2012)
- Daniel Tomkins, PhD, TAMU: Parallel Strongly-Connected Components algorithm (Fall 2011—Fall 2012)
- Nedal Mourad, MS, KAUST: Implementing Google’s MapReduce Framework in STAPL (Summer—Fall 2010)
- Mustafa Nabulsi, MS, KAUST: Parallel topological sort (Summer 2010)
- Eyad Al-Sibai, MS, KAUST: Parallel find algorithms in STAPL (Summer 2010)
- Nicolas Castet, MS, TAMU: STAPL Parallel Graph Partitioning Framework (Fall 2010—Spring 2013)
- Rajan Yadav, MS, TAMU: Parallel algorithms in STAPL (Fall 2010)
- Aditya Nandkumar, MS, TAMU: Parallel algorithms in STAPL (Fall 2010—Spring 2011)
- Fuad Jamour, MS, KAUST: Implementing Google’s Pregel Framework in STAPL (Summer 2012)
- Jeremy Cong-Trung Vu, BS, TAMU: Performance testing graph container in STAPL (Fall 2009—Spring 2011)
- Olivier Rojo, BS, EPF Ecole d’ingénieurs: Parallel sort algorithms in STAPL (Fall 2010)
- Vincent Marsy, BS, EPF Ecole d’ingénieurs: Parallel algorithms in STAPL (Fall 2011)
- Jean-Francois Cotreuil, BS, EPF Ecole d’ingénieurs: Parallel algorithms in STAPL (Fall 2011)
- Dennis da Cunha, BS, University of Pernambuco: Parallel Particle-Swarm Optimization (Fall 2011)

## LEADERSHIP & ACTIVITIES

- **Mentoring Director**, Computer Science and Engineering Graduate Student Association (2012—2013)
  - Helped design and implement mentoring program for incoming graduate students.
  - Helped shape 5-year strategic plan for department of Computer Science and Engineering.
- **Graduate Advisor**, Upsilon Pi Epsilon Computer Science & Engineering Honor Society (2011—2014)
  - Restarted society at Texas A&M University.
- **Graduate Advisor**, Eta Kappa Nu Electrical and Computer Engineering Honor Society (2009—2014)
- **Representative**, Parasol Lab, CSE Graduate Student Association (2011—2013)
- **President**, Eta Kappa Nu Electrical and Computer Engineering Honor Society (2008)
  - Restarted society at Texas A&M University.
- **Vice President**, Tau Beta Pi Engineering Honors Society (2008)
- **Programming Chair**, ACM/Texas A&M Computing Society (2007)
- Languages: Fluent in **English, Hindi, Sanskrit**. Beginner: **German, Turkish, French**.
- Organizations: IEEE, ACM, Tau Beta Pi, Eta Kappa Nu, CSEGS, Texas A&M Kendo.

## TECHNICAL EXPERTISE

- Operating Systems: Windows, Linux, Unix, Mac OS.
- Languages: C, C++/STL/Boost, Java, Assembly (x86, MIPS, ARM), Verilog, Perl, Python, Haskell.
- **Generic programming, Parallel programming**, Programming Libraries Development.
- Software: GCC/G++, Visual Studio, pSpice, QuestaSim, emacs, Maple, Matlab, Latex.