

# Nathan Bell

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## CONTACT INFORMATION

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## PROFESSIONAL INTERESTS

Generic programming, high-level libraries, sparse linear algebra, fine-grained parallelism

## EDUCATION

**University of Illinois Urbana-Champaign**, Urbana, Illinois  
Ph.D., Computer Science, August 2008

**Georgia Institute of Technology**, Atlanta, Georgia  
B.S., Computer Science, August 2003, *High Honors*  
B.S., Discrete Mathematics, August 2003, *High Honors*

## PROFESSIONAL EXPERIENCE

**NVIDIA Corporation**, Santa Clara, California  
*Senior Research Scientist*

**August 2008 - Current**

- Co-designed and developed Thrust, a high-level parallel algorithms library
- Productized Thrust in the CUDA Toolkit for programming GPUs
- Created Cusp, a library for sparse matrix operations on CUDA
- Developed the first fully GPU-accelerated algebraic multigrid (AMG) solver

**NVIDIA Corporation**, Santa Clara, California  
*Research Intern*

**May 2007 - August 2007**

- Researched efficient methods for sparse matrix-vector multiplication on GPUs
- Resulting publications have received hundreds of citations

**University of Illinois Urbana-Champaign**, Urbana, Illinois  
*Teaching Assistant*

**2003 - 2007**

## HONORS AND AWARDS

**Best Paper** ACM SIGGRAPH/Eurographics Symposium on Computer Animation, 2005

**Incomplete List of Teachers Ranked as Excellent**  
University of Illinois at Urbana-Champaign, Spring 2004

## OPEN-SOURCE PROJECTS

**Thrust** - Parallel Algorithms Library in C++

**Cusp** - Generic Parallel Algorithms for Sparse Matrix and Graph Computations

**PyAMG** - Algebraic Multigrid Solvers in Python

**PyDEC** - A Python Library for Discretization of Exterior Calculus

**SciPy** - Scientific Tools for Python

## SELECTED PUBLICATIONS

**Thrust: A Productivity-Oriented Library for CUDA**

Nathan Bell and Jared Hoberock  
GPU Computing Gems (Jade Edition), October 2011

**Exposing Fine-Grained Parallelism in Algebraic Multigrid Methods**

Nathan Bell, Steven Dalton and Luke Olson  
NVIDIA Technical Report NVR-2011-002, June 2011

**Implementing Sparse Matrix-Vector Multiplication on Throughput-Oriented Processors**

Nathan Bell and Michael Garland  
Proceedings of Supercomputing '09, November 2009

**Particle-Based Simulation of Granular Materials**

Nathan Bell, Yizhou Yu and Peter J. Mucha  
ACM SIGGRAPH/ Eurographics Symposium on Computer Animation 2005, August 2005