

# TUAN ANH NGUYEN

## Home Address

1065 Terrell Street NW, APT B

Atlanta, GA 30318

Phone: 404 468 7694

Email: [tuananh@cc.gatech.edu](mailto:tuananh@cc.gatech.edu)

## Education

- *PhD student in Computational Science and Engineering, 08/2007 - current*  
Georgia Institute of Technology, Atlanta, Georgia. GPA: 3.82
- *European MS in Aerospace – minor Space Technology, 09/2007*  
EuMAS(joint European international programme)  
SUPAERO, Toulouse, France and University of Pisa, Pisa, Italy
- *BS in Computer Science and Engineering, 02/2007*  
Ho Chi Minh City University of Technology, Ho Chi Minh, Vietnam

## Skills

Programming language: C/C++, FORTRAN, MPI, OpenMP.

## Relevant courses

- High performance computing, Numerical Linear Algebra, Iterative methods, Numerical method for partial differential equations, Computational Science and Engineering Algorithm, Simulation and Modeling, Computational Data Analysis.

## Experience

- **Research Center, General Electric** **NY, USA**  
Checkpoint/restart for umatgcr, a parallel nucleation simulation (05/2011-08/2011)
  - Studied the checkpoint and restart mechanism for MPI applications.
  - Determined the way to checkpoint/restart for umatgcr.
  - Implemented the checkpoint/restart for umatgcr.
- **Georgia Institute of Technology, Atlanta, GA ( 09/2007-present )** **USA**  
Optimizing communication for IO staging ( 08/2011 – present )
  - Studied IO staging, an augmented IO service.
  - Proposing and implementing message pipelining, and adaptive message parallelism to accelerate data transfer.
  - Proposing and implementing an adaptive scheduling to avoid perturbation for application communication.

High performance computing for brain tumor images analysis (02/2010 – 05/2011)

- Studied how the parallel simulation programs of biophysical model works
- Found the way to recover the tumor parameters & registered images of the tumor growth model given atlases and patient images
- Implemented the diffeomorphic image registration
- Integrated three modules: parallel registration module, parallel tumor growth module and parallel optimization module.

## Tuan Anh Nguyen

Page 2

Designed parallel algorithms for image segmentation (5/2009 – 01/2010)

- Studied the image segmentation algorithm in the Nature paper of Sharon.
- Studied the segmentation method using MATLAB, and C++.
- Proposed and implemented a parallel algorithm based on directed acyclic graph (DAG) for the image segmentation.
- Got the  $80\% \cdot N$  speedup on N-cores systems.

Improved the performance of CSELa's programs by using CUDA (3/2009 – 5/2009)

- Studied CUDA GPU.
- Implemented Stoke code on GPU, got over 100x speed-up.
- Implemented v-list part of the SC' 09 paper on CUDA GPU, got 5x speed-up.

Implemented heat conduction on Cell BE (3/2009 – 5/2009)

- Implemented and verified the heat conduction code in Cell BE.
- Optimized the code on Cell BE, got over 10x speed-up.

Measured the performance of random memory access on Cell BE (11/2008-12/2008)

- Studied Cell BE.
- Implemented a benchmark to measure the performance of random memory access on Cell BE.

Improved performance of parallel aerospace simulation program (5/2008 – 3/2009)

- Implemented and verified the heat conduction code using MPI and OpenMP in FORTRAN.
- Evaluated the performance of SPEC 107.leslie3D code, the program in Computational Combustion Lab.
- Determined and implemented the solutions to improve the SPEC performance.

Designed LBE interface and making parallel flow simulation (9/2007-5/2008)

- Learned Qt.
- Designed the interface for Lattice Boltzmann Equation (LBE) using Qt.
- Made the parallel simulation for Couette and Poisson flow.

- **SUPAERO ( 4/2007 - 9/2007)**

**France**

*Thesis:* panoramic vision for Simultaneous Localization and Mapping

- Studied visual odometry Simultaneous Localization and Mapping(voSLAM).
- Implemented the voSLAM simulation on standard and paracatadioptric cameras
- Analyzed the stability and time processing of voSLAM on those cameras.

- **Ho Chi Minh City University of Technology**

**Vietnam**

*Thesis ( 2/2005 – 2/2006 )* : Research on the mechanism of Checkpoint and Recovery. Developing the library to recover processes when problems occur in PVM

- Examined the characteristics of PVM (Parallel Virtual Machine) system.
- Investigated the mechanism of checkpoint and recovery in distributed systems.
- Determined the best solutions and algorithms to checkpoint and recover applications using PVM in SuperNode II system.

## Tuan Anh Nguyen

Page 3

**International research project (2/2003 – 9/2005):** Service creation by using service components

- Delved into properties of distributed systems: process management, process migration, resource management, communication protocols, parallel architecture, parallel algorithms, parallel processing, and parallel programming.
- Probed modern features in networking: internet protocols, network architecture, Web services, Intelligent Network, IP telephony.
- Mastered different types of programming: logic, structure, declarative, object oriented, and component. Studied over 10 programming languages: C, C++, C#, Java, Visual Basic, Pascal, Small Talk, Prolog, LISP, and FORTRAN.
- Proposed an innovative network architecture that helps to create new better services based on available service components written in different languages.

### Honors and Awards

- 08/2007 – present: Graduate Research Assistantship of Georgia Tech.
- 2009 : Best paper award in 2009 SuperComputing Conference (SC' 09)
- 04/2007 – 08/2007: Research Assistantship of SUPAERO.
- 9/2005 – 09/2007: Fellowship of EuMAS, European Masters Course in Aeronautics and Space Technology.
- 9/2003 – 2/2006: Scholarship of HCMC University of Technology for Highest Honors students.
- 2003: Honorable Mention in the National Olympiad Algebra Competition.

### International publications

#### Journal

- **2012:** Ilya Lashuk, Aparna Chandramowliswaran, Harper Langston, Tuan-Anh Nguyen, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Ying, Denis Zorin, and George Biros. *A massively parallel adaptive fast multipole method on heterogeneous architectures*. Communications of the ACM (CACM) (accepted).

#### Conference

- **2012:** Tuan Anh Nguyen, Hasan Abbasi, Fang Zheng, Matthiew Wolf, Karsten Schwan; *Communication optimization for IO staging*; working paper for SuperComputing 2012.
- **2009:** Ilya Lashuk, Tuan-Anh Nguyen, Aparna Chandramowliswaran, Harper Langston, Rahul Sampath, Aashay Shringarpure, Richard Vuduc, Lexing Yingy, Denis Zorinz, and George Biros ; *A massively parallel adaptive fast-multipole method on heterogeneous architectures*; In proceedings of the 2009 SuperComputing Conference (SC 09, November 14-20, Portland, USA)
- **2005:** *SCDL - Service creation description language for IIS architecture*; Tuan Loc Nguyen, Tuan Anh Nguyen; In proceedings of the 2005 International School on computational Sciences and Engineering (COSCI 2005, March 2-4, Ho Chi Minh City, Vietnam).

### Other activities

- 2004: volunteer of Blue Summer Campaign in Cu Chi: taught, participated in social activities.
- Interests include: traveling, reading, playing soccer, running and cooking.