QIMING LU

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EDUCATION:

- 2004 – Present: **Ph.D. in Physics**, GPA 4.0/4.0, Expected completion: May 2009
  Rensselaer Polytechnic Institute (RPI)
- 2001 – 2004: **Master of Science in Physics**, GPA 3.8/4.0, June 2004
  University of Science and Technology of China (USTC)
- 1997 – 2001: **Bachelor of Science in Physics**, June 2001
  Bachelor of Science in Computer Science, June 2001
  University of Science and Technology of China (USTC)

COMPUTER SKILLS:

- Programming Languages: **C/C++** (7 yrs), **Java/JavaScript/JSP/Servlet** (3 yrs), **MPI/PThread** (3 yrs).
- **P**arallel and serial programming; **N**umerical solving of linear and nonlinear PDEs; **M**onte Carlo simulation; **M**olecular Dynamics simulation; **A**lgorithms to construct and analyze complex systems; **E**xperiences of coding on large-scale parallel super computers (BlueGene/L); **D**irectX programming; **N**atural Language Processing with Lucene.

RESEARCH EXPERIENCES:

- 9/2004 – Present **Graduate Research Assistant**
  Dept. of Physics, Dept. of Computer Science, Rensselaer Polytechnic Institute

  ***M**odeling of complex networks and systems; **D**ynamics and stochastic processes on networks, such as: Opinion formation, human interactions, and community detection in social networks; **T**ransportation and flow analysis in information networks. **W**rote agent-based simulation code for dynamical processes on large-scale empirical social networks (with millions of agents; **W**rote framework to visualize dynamical processes on complex networks; **P**roposed error-tolerance alerting algorithm on wireless sensor networks.*

- 5/2008 – 8/2008 **Graduate Research Assistant (Summer Internship)**
  Center for Computer and Computational Science, Los Alamos National Laboratory

  ***R**esearches of network properties in bottom-up nano- and bio-fabrication built highly complex functional structures (Network on-Chip). **W**rote simulation codes for dynamics in Random Boolean Networks; **F**igured out the dependence of damage spreading in complex systems on the details of network topologies.*

- 7/2006 – 9/2006 **Graduate Research Assistant (Summer Internship)**
  Center for Nonlinear Studies, Los Alamos National Laboratory (LANL)

  ***S**tudied systems with many degrees of freedom where collective and competing interactions can give rise to highly complex and organized structures and dynamics; **W**rote molecular dynamics simulation codes for vortex lattices in superconductors; **F**ound a new phenomenon called Reversible Ratchet Effect and proved to be existing in superconductors theoretically.*

- 9/2001 – 7/2004 **Graduate Research Assistant, Dept. of Physics, Univ. of Sci. and Tech. of China**

  ***S**tudied non-linear phenomena in spatial and artificial plasmas, e.g., the generation and evolution of spatial plasma shock waves, accompanied transportations, turbulences, and energy dissipations; **W**rote codes for Mageneto-Hydrodynamics (MHD) simulations of complex plasma systems; **D**eveloped methods for high-precision-numerical-solving of nonlinear partial differential equations.*

- 9/2000 – 6/2001 **Researches for Undergrads, Dept. of Comp. Sci., Univ. of Sci. and Tech. of China**

  ***Q**ualitative simulations of electroencephalogram (EEG). Developed a qualitative model to evaluate EEG records of epileptics.*

OTHER PROJECTS:

- Video game software development using DirectX (~20,000 lines of source code), 2000
- Government website for construction bureau of Anhui Province, China, 2001
- Design of long distance microwave TV signal transmission route over sea surface, 2003
- Automatic Chinese words segmentation in natural language processing, 2004
- Web based merchandise and sales management system for a company in China, 2007

HONORS:

- Founders Award of Excellence, RPI, 2008
- Outstanding Graduate Student Award, USTC, 2004
- Guang-Hua Educational Scholarship, USTC, 2001
- Won Software Design Competition of Eastern China, 2000
- Outstanding Student Scholarship, USTC, 1997 ~ 1999

PUBLICATIONS:

1. The Naming Game on Social Networks: Community Formation and Consensus Engineering, Q. Lu, G. Korniss, and B.K. Szymanski, Journal of Economic Interaction and Coordination (2008, submitted)

2. Damage Spreading in Spatial and Small-world Random Boolean Networks, Q. Lu, and C. Teuscher, Physics Review E (2008, submitted)

3. Naming games in two-dimensional and small-world-connected random geometric networks, Q. Lu, G. Korniss, and B.K. Szymanski, Physics Review E 77, 016111 (2008)

4. Reversible Vortex Ratchet Effects and Ordering in Superconductors with One-Dimensional Asymmetric Potential Arrays, Q. Lu, C.J. Olson Reichhardt, and C. Reichhardt, Physics Review B **75**, 054502 (2007)

5. Naming Games in Spatially-Embedded Random Networks, Q. Lu, G. Korniss, and B.K. Szymanski, Interaction and Emergent Phenomena in Societies of Agents, The American Association for Artificial Intelligence Fall Symposium, 2006, p148~155

6. Threshold-Controlled Global Cascading in Wireless Sensor Networks, Q. Lu, G. Korniss, and B.K. Szymanski, Proceedings of the Third International Conference on Networked Sensing Systems, 2006

7. Simulation of Space Collisionless Shocks with Ideal MHD Equations, Q. Lu, and W. Yang, Chinese Journal of Space Science, 24(3), 2004, p161~168

8. The Analysis of Temperature Inversion over Sea Surface and Its Effects toward Microwave Transmission, Q. Lu, and R. Lu, Radio & TV Broadcast Engineering, 2004.10

9. The Maximum Probability Algorithm for Automatic Chinese Word Segmentation Based on Context, Y. Jin, Q. Lu, and F. Gao, Computer Engineering, 2004.8

10. Time Evolution of Artificial Plasmas, Q. Lu, and W. Yang, Nuclear Fusion and Plasma Physics, 24(1), 2004, p33~38

11. Simulation of Interactions between Space Shocks and Interplanetary Structures, Q. Lu, and W. Yang, The 2nd International Workshop on Nonlinear Plasma Science, 2003.7 Proceedings

12. The Diffusion of Plasma Clouds in Atmospheric Environments, Q. Lu, and W. Yang, The 2nd Conference of National Academy of Science on Plasma Physics and Nuclear Fusion, 2002.12

TALKS AND POSTERS

1. "Damage Spreading in Spatial and Small-world Random Boolean Networks", 2008 Los Alamos National Laboratory Student Symposium (August 5, 2008) (technical talk)

2. "Engineering Consensus in Social Networks", 9th Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University (October 13, 2007) (contributed talk)

3. "Naming Game in Social Networks", NetSci 2007: International Workshop and Conference on Network Science, New York Hall of Science, Queens, New York (May 20, 2007) (contributed talk).

4. "Naming Games in Spatially-Embedded Random Networks", NetSci 2007: International Workshop and Conference on Network Science, New York Hall of Science, Queens, New York (May 20, 2007) (poster).

5. "Threshold-Controlled Global Cascading in Wireless Sensor Networks", 3rd International Conference on Networked Sensing Systems, Chicago, Illinois (May 31, 2006) (contributed talk)

6. "Naming Games in Spatially-Embedded Random Networks", NetOpt 06: Optimization in Complex Network, Los Alamos, New Mexico (June 19, 2006) (poster)

7. "Threshold-Sensitive Global Cascades in Wireless Sensor Networks", NetOpt 06: Optimization in Complex Network, Los Alamos, New Mexico (June 19, 2006) (poster)

8. "Threshold controlled cascading dynamics on random geometric graphs", 7th Annual Greater Boston Area Statistical Mechanics Meeting, Brandeis University (October 22, 2005) (contributed talk)