GANG CHENG

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EDUCATION

- **Ph.D. Candidate**, *Computer and Information Science*,
  Syracuse University, Syracuse, NY, August 1991 - date.
- **M.S.**, *Computer Science and Engineering*,
  Huazhong University of Science and Technology, China, September 1985 - May 1988.
- **B.S.**, *Computer Science and Engineering*,
  Huazhong University of Science and Technology, China, September 1979 - May 1983.

AWARDS AND HONORS

1. Supercomputing '93 Student Paper Award, Best student paper in the area of Graphics Application.
2. Member of Phi Beta Delta - Honor Society For International Scholars, Alpha Sigma Chapter at Syracuse University, 1994 - date.
3. Co-developer of a Patent issued by the People's Republic of China. "A New Intelligent Magnetic-card Lock", Patent No.: ZL 92 2 14120.7. May 27, 1993.

EXPERIENCE

Northeast Parallel Architectures Center at Syracuse University 08/1991 - date

Mr. Cheng has participated in several MPP application projects at NPAC in the area of financial modeling, electromagnetic scattering simulation, four-dimensional data assimilation, weather modeling and geographic information system. Serving as a system analyst and a researcher in those projects, he has broad experience in developing scientific and industrial applications of parallel computing.

In a financial modeling project funded by Digital Equipment Co. and Syracuse University, Mr. Cheng developed a set of parallel stock option pricing models on massively parallel systems, Connection Machines CM2 and CM5, DECmpp-12000, nCUBE2, and on networked workstations. He designed and implemented an interactive visualization environment for this application, in which computational models running on multiple MPP systems and workstations are coupled over a local area network with a network-based graphical user interface.

Mr. Cheng has developed a high performance computing and visualization system for an electromagnetic scattering(EMS) simulation. In this DARPA-funded project, he integrated parallel EMS programs on the CM5 into an interactive data visualization environment to take the advantages of high performance computing and sophisticated 3D graphical display.

He has actively participated in the NSF REU programs at NPAC, served as a co-advisor of a REU student project in 1993 and gave seminars in 1993 and 1994.

Mr. Cheng played an active role in a NASA funded HPCC "Grand Challenge" application project in four-dimensional data assimilation, in which he was responsible for the parallel implementation of a trajectory model and system integration/visualization. Working with one of NPAC's industrial partners, currently he is a NPAC project leader of a U.S. Air Force Wright Laboratory funded project to develop and implement advanced computational electromagnetics techniques on massively parallel computing architectures.

Mr. Cheng has also actively involved in a variety of other application projects at NPAC, including MPP implementation of a weather modeling system, a GIS-based environmental modeling system and a health application project. He has extensive expertise in MPP software development, parallel databases, algorithm design, network programming, computer graphics and programming languages.

Information System Support Laboratory, 03/1991 - 08/1991, Virginia Tech, VA

Working as an application analyst in the VirGIS(Virginia Geographic Information System) project, Mr. Cheng developed a vector-based spatial database management and map display system which manages and generates high quality graphics of DLG maps in many ways.

Chengdu Institute of Computer Applications, 06/1988 - 01/1991 Chinese Academy of Sciences, P.R. China

As a project leader and a senior software engineer, Mr. Cheng was involved in a number of application projects in the area of artificial intelligence programming environment, database and GIS systems, and magnetic-card data processing products.

Chengdu Institute of Geography, 06/1983 - 07/1985 Chinese Academy of Sciences, P.R. China

Mr. Cheng was working as an application programmer in the area of computer applications in earth science, particularly, GIS applications in mountain disasters.

Selected Publications

1. G. Cheng, K.A. Hawick, G. Mortensen and G. C. Fox, "Distributed Computational Eletromagnetics Systems," to appear in Proc. of the 7th SIAM conference on Parallel Processing for Scientific Computing, Feb. 15-17, 1995.

2. G. Cheng, G. Fox, K. Mills and Marek Podgorny, "Developing Interactive PVM-based Parallel Programs on Distributed Computing Systems within AVS Framework," in Proc. of the 3rd Annual International AVS Conference, JOIN THE REVOLUTION: AVS'94, Boston, MA, May 2-4, 1994.

3. Cheng, G., Sparling, L., Mills, K. and Lyster P., "Four Dimensional Data Assimilation (NASA HPCC): Parallel Trajectory Model," Poster presentation at IEEE Supercomputing '93,Portland, OR, November 1993, IEEE Computer Society Press, Los Alamitos, CA.

4. G. Cheng, G.C. Fox, and K. A. Hawick, "A Scaleable Paradigm for Effectively-Dense Matrix Formulated Applications", in Proc. of the European Conference and Exhibition on High-Performance Computing and Networking (HPCN Europe) 1994, Munich, Germany, 1994.

5. G. Cheng, Y. Lu, G.C. Fox, K. Mills and T. Haupt, "An Interactive Remote Visualization Environment for an Electromagnetic Scattering Simulation on a High Performance Computing System," in Proc. of Supercomputing '93, Portland, OR, Nov. 14-17, 1993.

6. G. Cheng, K. Mills and G. Fox, "An Interactive Visualization Environment for Financial Modeling on Heterogeneous Computing Systems," Proceeding of 6th SIAM Conference on Parallel Processing for Scientific Computing(Norfolk, Virginia, March 22-24, 1993) (R. F. Sincovec, eds.), SIAM, Philadephia, 1993.

7. K. Mills, M. Vinson, and G. Cheng, "A Large Scale Comparison of Option Pricing Models with Historical Market Data," Proceedings of 4th Symposium on the Frontiers of Massively Parallel Computation (McLean, Virginia, October 19-21, 1992), IEEE Computer Society Press, Los Alamitos, California, 1992.

8. G. Cheng, C. Faigle, G. Fox, W. Fumanski, B. Li and K. Mills, "Exploring AVS for HPDC Software Integration: Case Studies Towards Parallel Support for GIS,", to be presented at AVS Conference AVS'93, Lake Buena Vista, FL, May, 1993.

9. K. Mills, G. Cheng, M. Vinson, S. Ranka, and G. Fox, "Software Issues and Performance of a Stock Option Pricing Model on the Connection Machine-2 and DECmpp-12000," in Proc. of Fifth Australian Supercomputing Conference, World Congress Centre, Melbourne, Australia, December, 1992.

10. G. Cheng and Y. Zhang, "A Functional + Logic Programming Language in Interpretation-Compilation Implementation," Lisp And Symbolic Computation: An International Journal, Vol. 5, No. 3, 133-156, 1992, Kluwer Academic Publishers.

11. G. Cheng, Z. Kang, "A Computer-Based Information System on Moving Elements of Debris Flow," in Proc. of Japan-China Symp. on Landslides and Debris Flows, 1989, Tokyo, Japan.

12. X. Huang and G. Cheng, "A Province-Wide Natural Disaster Precaution System: An Application of Geographic Information System to Natural Disaster Reduction," in Proc. of the 2nd International Workshop on GIS, Beijing '90, 1990.