Chengdu Institute of Computer Applications, Chinese Academy of Sciences 06/1988 - 01/1991

As a project leader or a 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, Chinese Academy of Sciences 06/1983 - 07/1985

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

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," submitted to Supercomputing '93, Portland, OR, Nov., 1993.(in review).

G. Cheng, K. Mills and G. Fox, "An Interactive Visualization Environment for Financial Modeling on Heterogeneous Computing Systems," in Proc. of the 6th SIAM Conference on Parallel Processing for Scientific Computing, R. F. Sincovec, eds., SIAM, Norfolk, VA, March 1993.

K. Mills, M. Vinson, and G. Cheng, ''A Large Scale Comparison of Option Pricing Models with Historical Market Data," Proc. of the 4th Symposium on the Frontiers of Massively Parallel Computation, McLean, VA, IEEE Computer Society Press, October 1992.

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.

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, Melbourne, Australia, December, 1992.

B. Li, K. Mills, F. Csillag, M. Podgorny, B. Vaughn and G. Cheng, "Integration of GRASS with High Performance Parallel Computing Environment," in Proc. of the 8th GRASS GIS Users Conference, Open Grass Foundation, Reston, VA, March 1993.

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, pp. 133-156, 1992, Kluwer Academic Publishers.

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

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, October, 1990.

Cheng, Gang Research Scientist
Northeast Parallel Architectures Center at Syracuse University

Education

Syracuse University, Syracuse, NY — Ph.D. Candidate, Computer and Information Science, 1991 - date

Huazhong University of Science and Technology, P.R. China — M.S., Computer Science and Engineering, 1988; B.S., Computer Science and Engineering, 1983

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.

Mr. Cheng is currently playing a major role in a NASA funded "Grand Challenge" application project in four-dimensional data assimilation. The goal of this project is to apply leading research in parallel software and algorithms to a number of existing techniques for data assimilation and to explore new data assimilation methodologies .

Mr. Cheng has also actively involved in a variety of other MPP application projects at NPAC, including a weather modeling system, a GIS-based environmental modeling system and a health application project. He has extensive expertise in MPP software development, algorithm design and programming, including CM2/5(CMfortran, C*, CMMD, CMX11), DECmpp-12000 (MPFortran, MPL, MPPE), nCUBE2(NDB), Intel iPSC/860(NX, Express, PVM), and in network programming, including Express, PVM and TCP/IP; computer graphics, including X Window (Xlib, X toolkit and OSF/Motif), AVS, as well as programming languages such as Fortran, C, C++, SQL, LISP, Prolog.

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

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.