Donghua Xu

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OBJECTIVE

A research/development position with a focus on networking, simulation, distributed computing or related areas.

EDUCATION

Georgia Institute of Technology
Ph.D. in Computer Science, 5/2005
Thesis: Scalability and Compose-ability Techniques for Network Simulation

National University of Singapore
M.S. in Computer Science, 2/1997
Thesis: Matching and Aligning English-Chinese Bilingual Texts of CNS News

Xiamen University, China
B.Eng. in Computer Science, 7/1994

WORK EXPERIENCE

Lucent Technologies - Bell Labs Advanced Technologies (5/2002 - 8/2002)
Research intern

- Developed a novel trace-interpolation method to accurately emulate packet delay in network.
- Modified NISTNet (a Linux kernel module for network emulation) to implement the above technique.
- Used modified NISTNet to test and evaluate real VOIP applications being developed.

Merrill Lynch Singapore (6/1998 - 8/1998)
Contract programmer

- Created Perl programs to extract certain stock trading data periodically from remote Oracle servers.
- Created Crystal Report front-end to generate various reports based on the data fetched above.
- Finished the project originally planned for half a year within 2 moths. Software still being used today.

IBM Singapore (4/1997 - 4/1998)
Contract programmer with CSA Holdings for infoserv.asia project

- Designed and implemented DB2 database-access APIs with C/C++ to support upper layer programs.
- Created CGI-based web administration interfaces with Perl for the use of service operators.
- Performed AIX 4.1/4.2, RS/6000 system administration for the development and testing servers**.**
- Helped other developers fix mysterious bugs, became well respected for debugging capability.

RESEARCH EXPERIENCE

Georgia Institute of Technology,
COMPASS (COMposable and Parallel Simulation of internetworkS) project.
PROBLEMS:

- Traditional network simulation scale hurdled by limited capacity of a single workstation
- Network simulation capability hurdled by limited features of a single simulation tool.

APPROACHES:

- Benchmark-based methodology to partition network simulation for best parallel running performance.
- State aggregation/compression techniques to reduce memory requirement of multicast simulation.
- Integration architecture to compose complex network simulation from different simulation tools.
- Plug-and-play framework to fit a new network module easily into different existing simulation tools.

RESULTS:

- Created tools to automatically partition NS2 simulations to be run by PDNS on a cluster.
- Achieved multicast simulations orders of magnitude larger than previously achievable.
- Composed complex wired/wireless hybrid simulations from NS2, PDNS and GloMoSim.
- Created DTN (Delay Tolerant Networking) simulation modules to fit into different simulators.
- Published a number of papers (see publication list).

RESEARCH EXPERIENCE (CONT'D)

Georgia Institute of Technology

Cryptography class project to develop new cryptography/security related methods.

PROBLEM:

- Web commerce security, HTTP cookie encryption

APPROACH:

- One-Time Pads, the only perfectly secret encryption method.

REULTS:

- Discovered unique characteristics of a class of applications including cookies suited for OTP encryption.
- Published a paper and short-listed for best paper award on ACSAC 2002.

National University of Singapore

Text alignment project.

PROBLEM:

- Aligning English-Chinese bilingual texts to create sub-sentence length translation database.

APPROACH:

- Genetic Programming, Dynamic Programming

RESULTS:

- Created web crawler in Perl to download bilingual news from CNS (Chinese News Service) website.
- Developed heuristics and C++ tools to match and align the news texts with Dynamic Programming
- Used Genetic Programming training on examples to obtain parameters for matching and aligning tasks.
- Published a paper on the journal "Machine Translation."

SKILLS

General: UNIX administration, C/C++, Perl, SQL, Oracle, DB2, Visual Basic, Crystal Report, x86 assembly, CGI/Web Programming, Tcl/Tk, Linux kernel programming.

Networking: networking simulators/emulators: NS2, PARSEC, GloMosim, QualNet, NISTNet; network monitoring tools: MRTG, Ganymede Chariot; SNMP; TCP/IP; Cisco IOS.

HONORS/AWARDS

Runner-up for Best Paper Award, Annual Computer Security Application Conference (2002)
Research Scholarship, National University of Singapore (1995-- 1997)
Computer World Award, China (1994, national award in China for outstanding computer science students)
Zi Qin Prize, Xiamen University (1994, campus-wise prize in Xiamen University for outstanding students)
Xiang Lu Prize, Xiamen City (1993, city-wise prize in Xiamen for outstanding Xiamen-born students)

PUBLICATIONS

- Donghua Xu, Mostafa Ammar, "BencHMAP: Benchmark-Based, Hardware and Model Aware Partitioning for Parallel and Distributed Network Simulation", *MASCOTS*, 2004.
- George Riley, Mostafa Ammar, Richard Fujimoto, Alfred Park, Kalyan Perumalla and Donghua Xu, "A Federated Approach to Distributed Network Simulation", *ACM Transactions on Modeling and Computer Simulation* (TOMACS), Vol. 14(2), April 2004.
- Donghua Xu, George Riley, Mostafa Ammar, Richard Fujimoto, "Enabling Large-scale Multicast Simulation by Reducing Memory Requirements", *Proceedings of Workshop on Parallel and Distributed Simulation*, 2003.
- Donghua Xu, Chenghuai Lu, Andre dos Santos, "Protecting Web Usage of Credit Cards Using One-Time Pad Cookie Encryption", *ACSAC*, 2002. (Shortlisted for Best Paper Award)
- Donghua Xu, George Riley, Mostafa Ammar, Richard Fujimoto, "Split Protocol Stack Network Simulations Using the Dynamic Simulation Backplane", *MASCOTS*, 2001.
- George Riley, Richard Fujimoto, Mostafa Ammar, Kalyan Permula, Donghua Xu, "Distributed Network Simulations Using the Dynamic Simulation Backplane", *ICDCS*, 2001.
- Donghua Xu, Chew Lim Tan, "Matching and Aligning English-Chinese Bilingual Texts of CNS News", *Machine Translation*, vol.14, issue 1, 1999.
- Donghua Xu, Chew Lim Tan, "Automatic Alignment of English-Chinese Bilingual Texts of CNS News", *ICCC*, 1996.