XIAOYI WU

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SUMMARY

Dr. Wu is a Senior Engineer at Cambridge Energy Solutions, LLC, a software company to develop software for the deregulated electric power industry. He is an software engineer with several years of experience in the Discrete event system modeling and simulation and corresponding software development, queueing systems analysis, Stochastic modeling and optimization, Linear/non-linear optimization, Business process modeling and reengineering, C++ application development, MS applications development, MS-SQL/ORACLE, relational database systems and software development including experience in object-oriented language.

Before joining CES, Mr. Wu has worked for two software firms. In Beijing Atomic Co. Ltd., he participated in the design and development of ERP (enterprise resource planning) software for Jewelry firms. In Tsinghua Tongfang Co. Ltd, he participated the development of a medical information system.

As a research assistant at the Boston University CODES Laboratory for system engineering, he devised a feedback-control based DDoS (Distributed Denial of Service) defense strategy. This strategy consists of a queue-content based local detection rule and a feedback-control mechanism, and adopted a gradient-based on-line algorithm to optimize the performance of a network while it is under attacks. In this algorithm, sensitivity analysis techniques were adopted to obtain the gradient estimates. He also designed a centralized optimal probabilistic routing algorithm that can achieve a good balance between security and performance. This algorithm adopts probabilistic routing to defend against energy-depletion attacks to sensor networks, and uses optimal control approaches to analyze and control the network behavior.

As a research assistant at the Tsinghua University system integration research center, he joined the national project: system integration for china aviation companies. In this project, he was responsible for process modeling, simulation, analysis, redesign and optimization for inter-enterprise cooperation. He also designed and developed an IDEF3-based business process modeling software.

Dr. Wu earned a BS in Eletrical Engineering from Tsinghua University in 1997, and a MS in Control Engineering from Tsinghua University in 2000. He received an Ph.D in System Engineering from the Boston University in 2006. His doctoral thesis is entitled "System engineering approaches to some network vulnerability problems."

EDUCATION

D. Sc., System Engineering, Boston University, May 2006.

M.S., Control Engineering, Tsinghua University , Junly 2000.

B.S., in Electrical Engineering, Tsinghua University, July 1997.

EXPERIENCE HIGHLIGHTS

Cambridge Energy Solutions, Cambridge, MA, June 2006- current, **Software Engineer.** Developing software tools to assist market participants in analyzing the electricity markets on a locational basis, forecast and value transmission congestion, and to understand the fundamental drivers of short and long term prices.

CODES lab of CISE center, Boston University, Boston, MA, Sep. 2001 – May 2006, Research Assistant. Joined the information vulnerabilities research project, and mainly focused on the defense again DDoS attacks and, wireless routing problems.

Beijing Atomic Co. Ltd., Beijing, China, 100083. August 2000 – July 2001, **Software Engineer.** Developed ERP software to manage Jewelry companies' production, marketing, and cash flows. Use UML to model the business process, and use C++/Visual Basic to develop three-layers business applications.

System Integration Research Institute, Beijing, China, 100084. Sep 1997 – July 2000, Research Assistant. Take part in the national project: system integration for china aviation companies. This project has got the china national reward.

FIELDS OF EXPERTISE

- Discrete Event System Modeling and Simulation
- Stochastic Optimization
- Stochastic Fluid Model and Perturbation Analysis
- Wireless Sensor Network Routing and Optimization
- Queueing System
- Linear/Non-linear optimization
- Business Process Modeling and Optimization
- C++ and COM+ application development
- Database tools: Oracle and SQL-Server

MAJOR PROJECTS

National Project on the research of information vulnerabilities

The objective of this project is to apply system and control engineering approaches in the modeling and analysis of network behavior under attack. By doing so, we can find a optimal way to defend against all kinds of attacks.

National Project of system integration among china aviation firms

Mr. Wu, mainly focused on two sub-projects: (a) proposed a modeling framework for business process and corresponding analysis method; (b) developed a business process modeling tools.

SELECTED PAPERS AND PUBLICATIONS

X. Wu. and C. G. Cassandras, "A Maximum Time Optimal Control Approach to Routing in Sensor Networks", in Proc. of 44nd IEEE Conf. on Decision and Control, 2005.

X. Wu and C. G. Cassandras, "A Feedback Control Defense Strategy for Denial of Service Computer Attacks", in *Proc. of 43nd IEEE Conf. on Decision and Control*, 2004.