Curriculum Vitae
Jun Ma

Current Position

Ph.D. Candidate
Department of Industrial Engineering and Management Sciences
Northwestern University
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Education

Ph.D. candidate in Industrial Engineering and Management Sciences (IE/MS),
Northwestern University (2000–Summer 2005)

Major: Optimization and Modeling Systems;
Minors: Financial Engineering; Organization Theory/Systems Engineering

GPA: 4.0/4.0

Committee:
Professor Robert Fourer (Chair)
- Northwestern University

Professor John Birge
- Dean, Engineering School, Northwestern University, before 07/2004
- Graduate School of Business, University of Chicago, after 07/2004

Professor Wei Chen
- Northwestern University

Professor Kipp Martin
- Graduate School of Business, University of Chicago

Dr. Thomas Tirpak
- Motorola Advanced Technology Center
- Kellogg School of Management, Northwestern University

Visiting Graduate Student, Graduate School of Business
University of Chicago (2003-Summer 2005)

Co-advisor: Professor Kipp Martin, Operations Research/Computing Technology

Master Program in Computer Science Department
University of Chicago (2002-2003)

10 Study Courses to complement research at Northwestern University

M.S. in Industrial Engineering and Management Sciences
Northwestern University (2000-2002)

GPA: 4.0/4.0

B.A. in Mathematics/Computer Science and Economics.
Wabash College (1995-1999)

summa cum laude
Phi Beta Kappa
GPA: 3.9/4.0

Associate B.S. in International Business Administration,
Shanghai International Studies University (1993-1995)

GPA: 3.9/4.0

Professional Experience

Researcher, Math and Computer Science Division, Argonne National Laboratory, IL, 2003-Present

Design and develop next-generation open Network Enabled Optimization System (NEOS), Servers, Registries and Solver Services.

System Architect, Virtual Design/Manufacturing, Advanced Technology Center, Motorola Inc., Schaumburg, IL (2001-2004)

2001: Developed optimization solvers using mathematical programming and heuristic algorithms; Developed Virtual Prototyping (VP) system and networked optimization architecture (1 Trade Secret, 2 patent disclosures).

2002: Consulted in engineering, financial and administrative domains, through highly data-driven processes: stochastic optimization, statistical analysis, simulation, data-mining, aimed at cutting cost; Developed key tools: PWB Manufacturing and Embedded Passive Electronic Design (1 Invention Award and 1 patent disclosure).

2003: Developed web service prototypes for VP expert system; Designed Black Box Function Approximation; Invented Automated Concept Exploration– Multidisciplinary Optimization (1 Engineering Award and 1patent disclosure).

2004: Worked with Corporate IT's Senior Leader Team to Integrate enterprise-wide Product Lifecycle Management (PLM) & Business Process Management (BPM) Systems (1 Engineering Award and 1patent disclosure).

Payroll-Accounting System Manager / HR Consultant, FFG Midway Airport, Chicago, IL (2000)

Mainframe Programmer, Computer/Marketing Analyst, Karen Marketing Inc., Chicago, IL (1999)

Financial Analyst, China Construction Bank, Shanghai (1994-95, 1997)

Honors & Awards

Future Practitioner, INFORMS Doctoral Colloquium, Denver, CO, 2004

MIP Award, 2003, Motorola Inc., 2003

Engineering Award, Motorola Inc., 2002-2004

Trade Secret/Patent Award, Motorola Inc., 2001-2003

NSF Research Fellowship, Northwestern University, 2001-2004

Cabell Fellowship, Northwestern University, 2000–2001

summa cum laude, Wabash College, 1999

Phi Beta Kappa, Wabash College, 1999

Distinction in Economics, Wabash College 1999

Warren Wright Shearer Prize for Best Economics Theorist, Wabash College, 1999

George Carscallen Prize for Best Mathematics / Computer Science Senior, Wabash College, 1999

1st Place, Indiana College Mathematics Competition, 1998, 1997

Fortnight King for solving the most biweekly mathematics problems, Wabash College, 1998, 1997

Top 500, Putnam National Mathematics Competition, 1998

Outstanding Youth Scholar Scholarship, Youth Scholar Scholarship Fund, 1998

Dean's List & Full Merit Scholarship, Wabash College, IN, 1995–1999

Top Elite Student Scholarship, Shanghai International Studies University, Shanghai China, 1995

Activities

Member, Optimization Technology Center (OTC), Argonne National Laboratory, 2002-Present

Member, Institute for Operations Research and Management Sciences (INFORMS), 2001- Present

Member, Institute for Industrial Engineers (IIE), 2003- Present

Member, Society for Industrial and Applied Mathematics (SIAM), 2003- Present

Member, Mathematical Association of America (MAA), 1996-1999

Treasurer, Vice President, President, Wabash International Student Association, Wabash College (1996–1998)

President, Student Association, Shanghai International Studies University, 1993-1994

Skills

Applied Mathematics: Combining Math (Operations Research, Math Programming, Optimization, Simulation, Queuing, Markov Analysis, Statistical Learning, Combinatorics, Graph Theory, Numerical/Algorithm Analysis, Game Theory, Information Theory and AI) with Computer & System Tools to Assist in Manufacturing, Transportation, Supply Chain, Enterprise Resource Planning, Inventory Control, Accounting, e-Commerce, Management and Decision Making.

Statistics/Finance/Marketing: Applying techniques in Data Mining/Machine Learning, Stochastic Processes, inference/prediction/forecasting, Econometrics, Financial Engineering, Knowledge Management, Direct Marketing and Investment Science using SAS, SPLUS, Minitab, Jump, Excel Spreadsheet Solver, @Risk Spreadsheet Simulation, Arena System Simulation.

Computer Programming: AMPL, JAVA, C/C++/C#, VB6/VB.NET, UML, LISP, Fortran, Pascal, Assembly, SQL, DHTML/XML/MathML, CSS/XSL, Servlet/JSP, ASP, PHP, SSI, CGI/Perl/Python, Java/VBScript, Applet, ActiveX, Unix Shell/System/ Network, Tcl/Tk/Expect, AWK/SED, MATLAB, Mathematica, Maple, Mathcad,

System/Architecture: RDBMS/SQL/JDBC/ODBC, XML DB, Multi-tier, ORM/Hibernate, MVC/Struts, Jasper, J2EE/EJB, .NET, RMI/CORBA/ActiveX, Web Services/SOAP/WSDL/UDDI/BPEL, Grid Computing/Globus, UML, Various Open Apache & SourceForge Projects

Open Source Environments: Globus, Axis, WSIF, WSIL4J, WebDAV, Struts, Tiles, Cocoon, Xerces, Xalan, Xindice, Log4J, Tablibs, Velocity, Jasper, Avalon, James, Hibernate, Torque, OJB, Ant, CVS, Watchdog, Junit, Cactus, Jakarta Commons, Regexp, Maven, Eclipse, Netbean, Apache/Tomcat, Jboss

Book

Modeling Systems & Optimization Services, with Robert Fourer and Kipp Martin, 2005

A first book on mathematical modeling systems, combining modern computing and distributed technologies with Operations Research; The book introduces Service Oriented Architecture based Optimization Services (OS) framework and its XML based application level network protocols (OSxL) for the next generation optimization over

Internet. [Part I: Modeling Systems; II: Computing & Distributed Technologies; III: Optimization Services]

Protocols

OSxL, with Robert Fourer and Kipp Martin,

XML based Application Level Networking Protocols – Optimization Services x Languages (OSxL), including 20+ sub-protocols on optimization representation, communications registrations and discoveries.

Areas of Projects and Research Efforts

OSxL (Networking Protocols – Application Tier)

Optimization Services (Service Oriented Architecture of Distributed Computing)

Optimization in Distributed Simulation System (Optimization/Distributed Simulation)

Modeling Systems (Mathematical Modeling)

Business/Engineering Process Management Systems (BPM/EPM, Process Management)

Product Lifecycle Management Systems (PLM, Engineering Design)

Stock Price Forecasting with Neural Network and Other Machine Learning Techniques (Financial Engineering)

Expediting Distributed Function Evaluation through Local Surrogate Approximation (Statistical/Machine Learning)

Black Box Optimization (Nonlinear Optimization)

Building Optimization System as an Internet Resource (Web Service/SOAP/XML)

Automated Concept Exploration In Engineering Design (Data Ming/Artificial Intelligence)

Virtual Prototyping Expert System (Decision Support System)

Designing Pricing Schemes for NEOS System at Argonne National Laboratory (Algorithm in E-Commerce)

Modified Feasible Direction Method for Mixed Integer Nonlinear Problems in Distributed System (Math Programming)

Embedded Passives Selection In Circuit Board Design (Engineering Design)

Print Wiring Board Utilization with Multiple Panel Vendors (Engineering/Manufacturing)

Papers

In preparation, for submission to journals in late 2004 or 2005

Robert Fourer, Jun Ma, Kipp Martin, "Optimization Services (OS), a General Framework for Optimization Modeling Systems."

Robert Fourer, Jun Ma, Kipp Martin, "Optimization Services Instance Language (OSiL), a General-Purpose Instance Representation for Optimization Problems."

Robert Fourer, Jun Ma, Kipp Martin, "Standardization of Optimization Services Communications over Internet and Distributed Systems."

Robert Fourer, Jun Ma, Kipp Martin, Thomas Tirpak, "Optimization Registry – the Next Generation NEOS."

Robert Fourer, Jun Ma, Thomas Tirpak, "Optimization over Abnormal Networks."

Motorola internal technical reports

Jun Ma, Thomas Tirpak, "Benchmark of Engineering Process Management Systems"(2004).

Larry Lach, Juan Lopez, Jun Ma, Thomas Tirpak, Weimin Xiao, "A Method for Automated Concept Exploration"(2003).

Thomas Tirpak, Larry Lach, Juan Lopez, Jun Ma, Weimin Xiao, "Virtual Prototyping at Motorola Inc."(2003).

Larry Lach, Juan Lopez, Jun Ma, Thomas Tirpak, Weimin Xiao, "A Method for Automated Concept Exploration"(2003).

Thomas Tirpak, Jun Ma, John Savic, Robert Crosswell, "Device Selection Method for Embedded Passive Design" (2002).

Thomas Tirpak, Jun Ma, John Savic, Robert Crosswell, "Cost-Efficient Selection of Devices and Resistive Inks for Embedded Passive Board Designs" (2001).

Jun Ma, Larry Lach, Thomas Tirpak, Weimin Xiao, "A Method for Large Scale Mixed Integer Nonlinear Optimization for Virtual Prototyping" (2001).

Presentations

At professional meetings

"A Unified XML-Based Framework for Optimization Services," INFORMS Annual Meeting, Denver (2004).

At Motorola

"Improving Engineering Simulation and Optimization," Motorola Inc. Corporate Presentation (2004).

"Optimization Services (OS) Framework and Virtual Prototyping System," Motorola Physical Realization Research Center (2004).

"Multidisciplinary Optimization and Automatic Concept Exploration," Motorola Annual Tech Fair (2003).

"An Intelligent Surrogate System," Motorola Annual Tech Fair (2003).

"Comparison of Distributed Systems," Motorola Advanced Technology Center (2003).

"Web Services and Simple Object Access Protocol for Mathematical Modeling," Motorola Advanced Technology Center (2003).

"Embedded Passive Design," Motorola Inc. Corporate Presentation (2002).

"Optimization in Print Wiring Board Penalization with Multiple Panel Vendors," Motorola Inc. Corporate Presentation (2001).

"Modified Feasible Direction Method for Optimization," Motorola Inc. Corporate Presentation (2001).

At Northwestern Industrial Engineering and Management Sciences Department and University of Chicago Graduate School of Business

"A General and Unified Design and Framework for Distributed Optimization" (2004).

"Web Services and Optimization" (2003).

"Optimization with Distributed Simulations" (2003).

"Designing Pricing Schemes for the NEOS System at Argonne National Laboratory" (2002).