Quanyan ZHU

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Objective

To seek an engineering position in a dynamic and versatile environment.

Summary of Qualifications

Working Skills:

- Strong verbal and written communication skills with a history of giving presentations / seminars.
- Proven track record of independent research and ability to produce under minimal supervision.
- Fast learning skills in understanding new technologies, software tools and programming languages.
- Functional / Technical spec writing for project development in a professional setting.
- Fluent in English, Chinese and French.

Programming Skills:

- Extensive MATLAB/Simulink experience: design / simulation of controllers, GUIs, scientific computing, image processing.
- Experience in SAS. Familiar with ANOVA techniques and analysis of correlation and linear regression.
- Fortran 77, Perl, Python, C / C++, Java 2EE: Terminal Emulator (VT220 & Kermit) with Windows GUI, Windows Socket Programming, Database programming (DAO, ODBC, JDBC), Multi-Thread programming, Data acquisition via serial port.

Engineering Skills:

- VHDL Design (Synopsis CAD tool): functional simulation and design optimization.
- RF Circuit and PCB desgn using ADS and Mentor Graphics
- Embedded Controller Design using PIC micro-controllers, Assembly in MPLAB.
- Digital circuit design and debugging: Digital Video Interfacing, TMDS video transmission, input / output isolation and buffer circuits/PCBs.
- Analog / Digital IC Design & Optimization: Scholastic experience with Cadence Tools, Hspice to complete significant projects including layout.
- Embedded C: DC motor control using Motorola MC68HC11.
- Ladder Logic & HMI : GE, Allen-Bradley, Omron, Panasonic, Siemens in various applications.
- Experienced and familiar with scientific measurement equipment: Tektronix Oscilloscope, Agilent Network Analyzer, Anritzu Synthesized Signal Generator, Real-time PXI Instruments, Optical Spectrum Analyzer,etc.

Education

Master of Applied Science in Electrical Engineering, University of Toronto, ON, Canada, Sept. 2006–Present

- Full-time Student and Research Topic on Power Control of Physical Layer of DWDM Optical Communication Networks
- Research interests: Communication Networks, Intelligent Control Systems, Distributed Systems and Decision-making under uncertainties.
- Courses taken: Optical Communication Networks, Distributed Systems, Nonlinear Dynamical Systems, Stochastic Systems and Multi-Agent Methods.
- University of Toronto Fellowship, 2006-2007
- NSERC Canada Graduate Scholarship (CGS-M), 2007-2008
- Member of Graduate Education Council, University of Toronto, 2007-2008
- Supervised by Professor L.Pavel

Bachelor of Engineering in Honors Electrical Engineering, McGill University, Montréal, QC, Canada, Sept. 2002 –Dec 2005.

- Major in Honors Electrical Engineering with Concentration in Control and Automation.
- GPA Overall: 3.75/4; GPA Major: 3.91/4
- Dean's Honor list, 2004-2005
- NSERC Undergraduate Summer Research Awards and Industrial Undergraduate Research Awards
- GRE: Verbal: 630/800 (Percentile: 90%); Quantitative: 800/800 (Percentile: 94%)
- 9 Graduate Level Courses taken: Embedded Systems, Robust Control Systems, Numerical Methods, Game Theory, Optimization,etc.
- Honors Thesis : *Market-based TCP/IP Congestion Control Design of Communication Networks*, Supervised by Professor P.Caines

Working Experience

Wolfram Research *Project Contractor*
Urbana Champagne,IL, USA **June. 2007 – Sept. 2007**
◇ Xignite financial data interface implementation and financial data mining and visualization.
◇ Chemical Data research and database programming in Mathematica Workbench for new features in Mathematica 6.
◇ Chemical reaction network implementation in Mathematica Online Calculate project.

Atomic Energy of Canada Limited (AECL) *Summer Research Engineer*
Deep River, Ontario **May 2007 – Aug. 2007**
◇ Optimizing CATHENA Fortran input file for simulating CANDU nuclear reactor using combinatorial techniques.
◇ Writing programming script in Perl and Fortran.

University of Toronto *Graduate Research Assistant*
Toronto, Ontario **Sept. 2006 – Apr. 2007**
◇ Developing DWDM fiber-optic communication system models
◇ Simulating in Matlab distributed power control algorithms based on game theory and optimization theory.
◇ Conducting experimental testing on a testbed optical system using PC-based computer infrastructure and real-time Labview.
◇ Dealing with optical equipment such as multiple wavelength laser light sources, optical amplifier, dynamic gain equalizer, optical broadband noise source and etc.

Paper and Pulp Research of Canada *NSERC Student Researcher*
Pointe Claire, Québec **May 2006 – Aug. 2006**
◇ Fortran 77 to implement Lattice-Boltzmann Method for optical properties in paper coating.
◇ Java GUI for graphical simulation.

Dept. of Chemistry, McGill University *Nanoscience Research Assistant*
Montréal, Québec **May 2005 – Aug. 2005**
◇ Designed a central control panel for real-time data acquisition and signal processing of femtosecond laser pulses in LabVIEW 7.1
◇ Performed statistical data analysis in SAS on acquired data.
◇ Developed Matlab codes for simulating molecular electronic spectra of quantum dots.

ECE Department, McGill University *Student Researcher*
Montréal, Québec **May 2004 – Aug. 2004**
◇ Designed and simulated PCBs of new metal-dielectric electromagnetic band-gap (EBG) structures using ADS and Mentor Graphics.
◇ Tested Printed Circuit Boards with Agilent Network Analyzer and performed data analysis.
◇ Designed and simulated distributed amplifier for the application of wideband communications.

Teaching Experience

Faculty of Applied Science, University of Toronto *Course Instructor*
Toronto, Ontario **Fall 2007**
◇ Teaching/Coordinating a fourth-year undergraduate level course MIE 404F Control Systems I.
◇ Lecturing, designing mid-term, final exams, evaluating student performances, etc.

Faculty of Applied Science, University of Toronto *Course Instructor*
Toronto, Ontario **Summer 2007**
◇ In charge of a course on Engineering Mathematics for high school students in Da vinci Engineering Enrichment Program (DEEP).

ECE Department, University of Toronto *Teaching Assistant*
Toronto, Ontario **Sept. 2006 – Present**
Courses Taught are:
- ECE 212 Circuit Theory (Fall 2006)
- ECE 356 Linear System and Control (Spring 2007)
- ECE 291 Calculus III (Fall 2007)
- ECE 196 Calculus I (Fall 2007)

Dept. of Mathematics, McGill Univ. *Teaching Assistant*
Montréal, Québec **May 2003 – Aug. 2006**
Courses taught are:
- MATH 261 Differential Equations (Fall 2003)
- MATH 271 Applied Linear Algebra (Winter 2004)
- MATH 381 Complex Variable and Transforms (Fall 2004)
- MATH 264 Advanced Calculus (Fall and Winter 2005).

Publications

Journal Papers:
1. **Quanyan Zhu** and L. Pavel , 'Enabling OSNR Service Differentiation Using Generalized Model in Optical Networks ', Submitted to IEEE Transactions on Communication, under review
2. **Quanyan Zhu** and L. Pavel , 'Stackelberg Game Approach in OSNR Optimization of WDM Optical Networks with Capacity Constraints ', Submitted to Computer Networks, under review
3. **Quanyan Zhu** and L. Pavel , 'A Nash Bargaining Approach to Power Control in WDM Optical Networks: Theory and Algorithm', Submitted to IEEE/ACM Transaction on Networking, under review
4. **Quanyan Zhu** and L. Pavel , 'Theory of Linear Games and its Application in Optical Networks', Submitted to Journal of Selected Area of Communications, 2008

Conference Papers:
1. **Quanyan Zhu** and L. Pavel , 'Efficient Pricing of Optical Networks in Constrained OSNR Nash Games', In preparation, to be submitted to GLOBECOM, 2009
2. **Quanyan Zhu** and L. Pavel , 'Pricing Design of Power Control Game in WDM Optical Networks: Constrained and Unconstrained Cases', In preparation to be submitted to Conference on Decision and Control (CDC), 2008
3. **Quanyan Zhu** and L. Pavel , 'Linear Games and Potential Games: Theory and Examples', In preparation, to be submitted to Conference on Decision and Control (CDC), 2008
4. **Quanyan Zhu** and L. Pavel , 'Stackelberg Revenue Maximization in Power Management of Optical Networks', In preparation to be submitted to Conference on Decision and Control (CDC), 2008
5. **Quanyan Zhu** and L. Pavel , 'A Study on the Trade-off Relation between Efficiency and Proportional Fairness in Nash Games', In preparation to be submitted to INFOCOM Student Workshop, 2008
6. **Quanyan Zhu** and L. Pavel , 'Differentiated Services in Power Management of WDM Optical Networks', To appear in the Proceedings of IEEE International Conference on Communications, 2008
7. **Quanyan Zhu** and L. Pavel , 'Stackelberg Game Approach to Constrained OSNR Nash Game', Submitted to American Control Conference (ACC), 2008
8. **Quanyan Zhu** and L. Pavel , 'Control-theoretic Approach to Constrained and Unconstrained Pricing Problem in Optical Power Control Nash Game', To appear in the proceedings of IFAC World Congress, Seoul 2008

9. **Quanyan Zhu** and L. Pavel, 'Linear Games with Linearly Coupled Constraints: Theory and Applications', To appear in the proceedings of INFOCOM 2008
10. **Quanyan Zhu** and L. Pavel , 'Pricing Design of Power Control Game in WDM Optical Networks via State-space Approach', Conf. Proc. of GLOBECOM 2007
11. **Quanyan Zhu** and L. Pavel, 'Solving Constrained OSNR Nash Game in DWM Optical Networks with a Fictitious Player', Conf. Proc. of 2007 IEEE BROADNETS
12. **Quanyan Zhu** and L. Pavel, 'End-to-End Link Power Control in Optical Networks Using Nash Bargaining Solution', Proc. of the First International Workshop on Game theory for Communication networks (Game-Comm), 2007
13. Jeffrey C.W.Ho, **Quanyan Zhu**, and Ramesh Abhari, 'Modeling of Transmission Lines with Textured Ground Planes and Investigation of Data Transmission by Generating Eye Diagram', IEEE EPEP 2004 conference proceedings.

Invited Talks

1. "Game-theoretically based power control in optical networks", Session TB11, Optimizations Days 2007, Montreal, Canada
2. "Intelligent power control in optical networks", U of T Connections, Canada, Toronto, 2007

Memberships

- IEEE, Member
- SIAM, Student Member
- Golden Key Honor Society, Member
- Ordre des Ingnieurs du Qubec (OIQ), Member of Student Section
- Canadian Institute for Photonic Innovation (CIPI), Member of Student Network
- Canadian Association of Physics (CAP), Member
- Young Inventors International, Member

Activities

Reviewer, American Control Conference 2008

Reviewer, IEEE Journal of Special Areas in Communications (JSAC) on Game Theory in Communication Networks, Sept. 2007–Dec. 2007

Reviewer, ASME Journal of Dynamic Systems, Measurements, and Control, July. 2007–Present

Council Member, *Graduate Education Council, University of Toronto, Canada*, Sep. 2007–Present

Secretary, *IEEE Toronto Communication Chapter, Toronto, ON, Canada*

Organizing Committee, *Connections: U of T Student Conference, Toronto, ON, Canada*

Publicity Chair and Student Co-Chair, *SMC 2007 annual international IEEE Conference on 'Systems, Man & Cybernetics', Montréal, QC, Canada*

Vice-President (External), *McGill IEEE Student Branch*, Aug. 2004–Aug.2006
Raising funds and gaining supports from the industry and coordinating the relations with IEEE Canada and other student branches.

Member, *McGill Solar Car Project*, May 2003–May 2004
Participated in the design of the controller circuit of the solar car.

Languages English, Chinese, and French.

Personal Interests Travel, Hiking, Basketball, Public Speaking, Golfing, Creative Writing, Photography, etc.

References Available Upon Request.