

Xing LIU, Ph.D. (Electrical Engineering)

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EDUCATION

- **Ph.D** (1993): Awarded by School of Electrical, Electronic and Systems Engineering, **University of Wales, Cardiff (now Cardiff University), U.K.** Research area: Engineering application of artificial intelligence; Thesis: Neural networks for system identification and prediction.
- **MSc** (1985): Awarded by Department of Electrical Engineering, **Hunan University, CHINA.** Thesis: Microprocessor based digital optimal control of motor drive systems.
- **BSc** (1981): Awarded by Department of Electrical Engineering, **Hunan University, CHINA.** Senior design project: Thyristor controlled DC motor drive systems.

WORK EXPERIENCE: Teaching

Full-Time:

- Sept. 2015 – present: Full-time lecturer, Institute of Technology, **University of Washington Tacoma, USA.**
- Sept. 2010 – Aug 2015: Chair, Department of Computing Science & Information Technology, **Kwantlen Polytechnic University, Surrey, BC, CANADA**
- May 2004 – Aug. 2010: Faculty member, Department of Computing Science & Information Technology, **Kwantlen Polytechnic University, Surrey, BC, CANADA**
- Sept. 2002 – April 2004: Assistant professor, Department of Electrical & Computer Engineering, **Gonzaga University, Spokane, USA**
- April. 1999 - Aug. 2002: Instructor, Computer Science Department, **Langara College, Vancouver, CANADA.**
- July 1995 - June 1997: Lecturer, Electrical Engineering Department, **Singapore Polytechnic, Republic of SINGAPORE.**
- Mar. 1985 - Sept. 1989: Lecturer, Department of Electrical Engineering, **Hunan University, CHINA.**
- Jan. 1982 - July. 1982: Assistant Lecturer, Department of Electrical Engineering, **Hunan University, CHINA.**

Part-Time Teaching (summer, emergency coverage, or continuing education):

- Jan. 2015 – Aug. 2015: Master of Software Systems program, **The University of British Columbia, CANADA**
- 2010 – 2012: Department of Information Technology, **Fairleigh Dickinson University (Vancouver Campus), CANADA**
- 1999 – 2002: Faculty of Applied Science Continuing Education, **Simon Fraser University, CANADA**
- 1998: Department of Computer System Technology, **British Columbia Institute of Technology, CANADA**

Courses Taught:

In UWT (Sept 2015 - June 2016):

- 1) TCES 230 Introduction to Logic Design
- 2) TCES 312 Electronic and Analog Circuits
- 3) TCSS 372 Computer Architecture
- 4) TCSS 465 Embedded Real-Time System Programming
- 5) TCES 421 Digital Integrated Circuit Design
- 6) TCES 430 Microprocessor System Design
- 7) TCSS 499 Undergraduate Research in Computing and Software Systems

Before Joining UWT (~ August 2015):

- 1) Analogue Electronics and Digital Electronics (Theory and Design)
- 2) Android Application Development
- 3) Business Mathematics
- 4) Business Statistics
- 5) C# Programming
- 6) C++ Programming
- 7) C++ for C Programmers
- 8) Circuit Theory
- 9) Computer Architecture and Assembly Programming (Intel x86 based)
- 10) Computer Architecture (Textbook by Heuring and Jordan) for computer engineering students
- 11) Computer Electronics
- 12) Computer Literacy
- 13) Computer Program Design
- 14) Control System Theory
- 15) Data Structures
- 16) Database Management Systems
- 17) DC Motor Drive Systems
- 18) Discrete Mathematics
- 19) Digital System Design
- 20) Distributed Systems
- 21) Embedded Linux
- 22) Facebook Application Development (PHP and JavaScript SDK based)
- 23) GUI and Object-Oriented Software Development Using Java
- 24) Human Factors and Interaction Design (Usability, UI Design)
- 25) Integrated Circuit Design
- 26) Introduction to Computer Science
- 27) Microcontrollers
- 28) Microsoft Office Applications
- 29) Motorola MC6811 Microcomputer Architecture and Assembly Programming
- 30) Multimedia
- 31) Neural networks and optical character recognition
- 32) Object-Oriented Programming Using Java
- 33) Object-Oriented Programming Using C++
- 34) Pattern Recognition Using Computer Vision and Neural Networks
- 35) Power Electronics
- 36) Real-time Computer Systems Engineering
- 37) Software Engineering
- 38) Systems, Control and Instrumentation

- 39) UNIX
- 40) VB.NET
- 41) Web Application Development (PHP and the MySQL database)
- 42) Web Application Development (HTML5, CSS3, XML, JavaScript, jQuery)
- 43) Web Application Development Using Microsoft ASP.NET (C#, .NET framework)
- 44) Web Programming Using Java: Servlets and Java Server Pages
- 45) Zigbee Wireless Sensor Networks
- 46) Wireless LANs

Curriculum Development

- Designed and implemented a new curriculum for a Bachelor of Technology in Information Technology degree (2011 ~ 2013)

Courses Developed Recently:

- **TCSS 573** Internet of Things (*UWT*)
- **TCE 421** Digital Integrated Circuit Design (*UWT*)
- iPhone App Development
- Android App Development
- Search Engine Optimization
- Wireless Technologies and Wireless Programming
- Security of Wireless Systems
- Security of Web Applications
- Wireless Sensor Networks

Lab Courses and Lab Development

- Wireless technologies and wireless programming
- Embedded and real-time Linux systems Using Linux
- Microcontrollers (Motorola HC6811)
- Object-Oriented Programming Using Rational Rose, Visual C++ and Java
- PC hardware labs
- Development software setup
- Linux web servers
- Control systems (temperature, position and speed control); software: MATLAB and SimuLink.
- PLC experiments
- Machine vision systems: MATROX IP8.

Senior Student Design Projects Advised:

- Wireless sensor network and energy harvesting. Pressure sensor (2016 at *UWT*)
- Android app projects, Kwantlen Polytechnic University (2013 – 2015)
- Web applications projects, Kwantlen Polytechnic University (2004 – 2015)
- Multimedia course projects, web development projects, Kwantlen Polytechnic University (2008 - 2015)
- Numerous wireless/mobile computing senior year student projects, Kwantlen Polytechnic University (2006 - 2015)
- Wireless Tracking System, University of Applied Science, Regensburg, Germany, Fall 2005
- Bluetooth Wireless Technology for Cable Replacement, Gonzaga University, Fall 2003 - Spring 2004
- Microprocessor controlled lead acid battery charger (1st place at IEEE Spokane Section Student Paper Contest; 2nd place IEEE Northwest Area Student Paper Contest), Gonzaga University, 2002 – 2003
- Various computer science projects (e.g. modelling a TV using Java), Langara College, 1999-2002
- Neural network based image recognition, BCIT, 1998
- Neural network based postcode recognition using an imaging system, Singapore Polytechnic, 1995

- Digital optimal control systems, Hunan University, 1988
- Microprocessor controlled DC motor drive systems, Hunan University, 1986

WORK EXPERIENCE: Research

- 2009: Wireless gas sensing system (supported by internal grant): project displayed at British Columbia Innovation Council's (BCIC) event CONNECT '09, Vancouver, BC, October 19, 2009.
- April 2005 to 2007: Wireless tracking system (supported by internal grant)
- Sept. 2002 – March 2005: Neural networks; embedded and real-time system using Linux, Internet based robotics.
- July 1995 - June 1997: Neural network based Optical Character Recognition. Research sponsored by Singapore Polytechnic.
- Jan. 1994 - June 1995: Research Associate. School of Electrical, Electronic and Systems Engineering, University of Wales, Cardiff, United Kingdom. Areas: neural network applications in mechanical machining and petroleum industry; dynamic system modelling, identification, and control; time-series prediction; manufacturing systems; CAD/CAM, CNC machine programming, CMM machine programming; investigation of fuzzy logic and expert systems; project coordination. Involved in projects funded by Welsh office and European Commission.
- Oct. 1989 – Sept. 1990: Visiting Researcher, School of Electrical, Electronic and Systems Engineering, University of Wales, Cardiff, United Kingdom. Neural networks and applications in dynamic system modelling, identification, and control. Work leads to an IBM (UK) sponsored research project and later Ph.D. study sponsorship.
- Feb. 1985 - Sept. 1989: Optimal control systems; DC motor drive systems; computer based diagnosis of electronic equipment. Control of systems with time-delays. Research funded by National Science Foundation of China and industry.

WORK EXPERIENCE: Industry

- Jan. 1999 - April. 1999: **Software Engineer**. Project: sonar signal processing for Kongsberg, Port Coquitlam, B.C., CANADA. Developed the algorithm for mapping the sonar coordinate-system with geographic coordinate system for incorporation into sonar positioning software.
- Jan. 1998 - Dec. 1998: **Consultant**. Project: textual input systems on cell phones for Tegic communications (now America On Line), Seattle, U.S.A. Intensive research for Chinese Language input on cell phones (incorporated into the award-winning T9 software).
- Jul. 1997 - Dec. 1997: **Software Engineer**. Digital signal processing software for Intrinsyc Software, Vancouver, B.C., CANADA. Implemented DLLs for a Windows-based signal-processing and automatic-control software; software maintenance; customer support.

PUBLICATIONS

Conference Papers

- 1) X. Liu and O. Baiocchi, An IoT Course for A Computer Science Graduate Program, International Conference on: Communication, Management and Information Technology (ICCMIT'16), Cosenza, Italy, April 26-29, **2016**.
- 2) X. Liu, Streamlining Courses for the Web Development Concentration of an IT Bachelor Degree Program, ACM SIGITE/RIIT 2014, October 15-18, **2014**, Atlanta, Georgia, USA.

- 3) X. Liu, Test-Run of the App-Driven Approach in Teaching A Mobile Programming Course, WCCCE 2014, The 19th Western Canadian Conference on Computing Education, May 2-3, **2014**, Richmond, Canada.
- 4) X. Liu, Design and Development of A Multimedia Course for A Bachelor of Information Technology Degree, The 8th International Technology, Education and Development Conference, Valencia, Spain, March 10 – 12, **2014**
- 5) C. Dong and X. Liu, A Mobile App for Learning Japanese, 2013 International Conference on ICT in Teaching and Learning, July 10-12, **2013**, Hong Kong and Macau.
- 6) X. Liu & Z. S. Gao, Design and Development of a Toxic Gas Information System, The 47th Annual IACIS (International Association for Computer Information Systems) Conference, October 3-6, **2007**, Vancouver , B.C., CANADA, p.70. (abstract)
- 7) X. Liu, A. Sen, J. Bauer and C. Zitzmann, A Software Client for Wireless Location Tracking of Patients, International Conference on Medical Imaging and Informatics, August 14-16, **2007**, Beijing, China, pp.217-228.
- 8) X. Liu, Mobile Computing: Applied Research and Course Development, WCCCE 2007 (Western Canadian Conference on Computing Education), May 3-5, **2007**, Kamloops, BC, CANADA.
- 9) X. Liu & J. R. Luo, Development of Application Software for A Wireless Position Tracking System, Telehealth 2007 (The Third IASTED International Conference on Telehealth), May 31- June 1, **2007**, Montreal, Quebec, Canada. pp.142-147
- 10) X. Liu, Building Linux Based Neural Network Applications, The 3rd IEEE International Conference on Cognitive Informatics, (ICCI'04), August 16-17, **2004**, pp.214-219, Victoria, BC, CANADA.
- 11) X. Liu, Neural Networks in Embedded Linux, Artificial Neural Networks in Engineering – ANNIE'2003, November 2-5, 2003, St Louis, USA. (paper appears in: Intelligent Engineering Systems Through Artificial Neural Networks, volume 13, Smart Engineering System Design: Neural Networks, Fuzzy Logic, Evolutionary Programming, Complex Systems, and Artificial Life, ASME Press, New York, **2003**, pp.801-806).
- 12) X. Liu & H. Rowlands, “A study of neural network structures and training data formats for an optical character recognition system”, 2nd Workshop on European Scientific and Industrial Collaboration (WESIC'99) Newport, UK, **1999**. pp.267-274.
- 13) X. Liu & H. Rowlands, “Automating the entering process of student examination results using neural network and machine vision techniques”, 4th Japan-France Congress & 2nd Asia-Europe Congress on Mechatronics, October 6-8, Kitakyushu, Japan, **1998**.
- 14) D.T. Pham & X. Liu, “A comparison of three types of neural networks for dynamic system identification”, IEEE - IMACS Symposium on Signal Processing, Robotics, and Artificial Neural Networks, April 1994, Lille, France, **1994**. pp.568-571.
- 15) D.T. Pham & X. Liu, “Identification of linear systems using recurrent neural networks”, Colloquium of Application of Neural Networks to Modelling and Control, **1992**, Liverpool, UK, paper 4, pp.1-11.
- 16) X. Liu & T. Tong, “Application of digital LQI controller to microprocessor based motor drives”, Proceedings of **1987** Beijing International Conference on Electrical Machines, 641-644.

Books

- 1) D.T. Pham & X. Liu, “Neural Networks for Identification, Prediction and Control”, Springer-Verlag, **1995**, London.

Chapters in Books

- 1) D.T. Pham & X. Liu, “Identification of dynamic systems using Elman and Jordan networks”, Chapter 17, in Neural Networks for Chemical Engineers, edited by A. Bulsary, Elsevier, Amsterdam, the Netherlands, **1995**. pp.573-591.

2) D.T. Pham & X. Liu, "Identification of linear systems using recurrent neural networks", Chapter 3, in Application of Neural Networks for Modelling and Control, edited by G.F. Page, J.B. Gomm and D. Williams, Chapman & Hall, London, **1993**. pp.25-34.

Journal Papers

- 1) D.T. Pham & X. Liu, "Training of Elman networks and dynamic systems modelling", International Journal of Systems Science, 27(2), **1996**, pp.221-226.
- 2) D.T. Pham & X. Liu, "Nonlinear-Adaline based GMDH neural networks for system modelling and prediction", International Journal of Systems Science, 25(11), **1994**. pp.1743-1759.
- 3) D.T. Pham & X. Liu, "Identification of linear and non-linear systems using recurrent neural networks", Artificial Intelligence in Engineering, 8, **1993**. pp.67-75.
- 4) D.T. Pham & X. Liu, "Dynamic system modelling using partially recurrent neural networks", Journal of Systems Engineering, **1992**, 2(2), pp.90-97.
- 5) D.T. Pham & X. Liu, "Neural networks for discrete dynamic system identification", Journal of Systems Engineering, **1991**, 1(1), 51-60.
- 6) D.T. Pham & X. Liu, "State space identification of dynamic systems using neural networks", Engineering Applications of Artificial Intelligence, **1990**, 3, pp.198-203.
- 7) X. Liu & T. Tong, "LQI control of discrete systems with time-delay", Control Theory & Applications (in Chinese), **1989**, 6, Suppl. I.1, pp.51-59.
- 8) X. Liu & T. Tong, "Performance study of Smith predictor control system with external disturbances", Control & Instruments in Chemistry Industry (in Chinese), **1987**, 14(5), pp.12-16.
- 9) X. Liu & T. Tong, "Digital optimal control of processes with time-delays", Automation & Instrumentation (in Chinese), **1987**, 4, pp.16-21.
- 10) X. Liu & T. Tong, "Johnson's method on accommodation of external disturbances and the design of a digital optimal regulator", Control Theory & Applications (in Chinese), **1986**, 3(3), pp.114-119.
- 11) X. Liu & T. Tong, "A discrete model for linear systems with time-delay", Automation & Instrumentation (in Chinese), **1986**, 2, pp.11-13.
- 12) X. Liu & T. Tong, "Microprocessor optimal control of a D.C. motor speed control system", MICRO (in Chinese), **1986**, 1, pp.66-76.

Seminars

- X. Liu, Artificial Neural Networks and Applications, ACM Spokane Section, April **2003**
- X. Liu, Neural networks and OCR, Singapore Polytechnic, **1996**

RECENT PROFESSIONAL DEVELOPMENT

- Jan **2007** IEEE Vancouver Security Workshop
- **2005**: Instructional Skills Workshop; Leadership course by Kwantlen Polytechnic University
- Fall **2004**: involved in developing the course "Introduction to Computation in Engineering Design" (for the Applied Science Department of Kwantlen Polytechnic University)

PROFESSIONAL SERVICES

Academic:

- Program Committee: IEEE ICTS4eHealth **2016** Workshop, Messina, Italy.
- Session Chair, **2014** ACM Conference on IT Education/IT Research (SIGITE/RIIT 2014), Atlanta, USA, October 15 – 18, 2014

- Member, International Scientific Advisory Board, The 7th International Conference of Education, Research and Innovation, November 17th – 19th, **2014**, Seville, Spain
- Program Chair, WCCCE 2014 - The 19th Western Canadian Conference on Computing Education, May 2-3 May, **2014**, Richmond, BC
- Session Chair, The 8th International Technology, Education and Development Conference, Valencia, Spain, March 10 – 12, **2014**
- Member, Editorial Board, International Journal of Business and Systems Research (IJBSR), **2008** ~ present
- Member, International Programming Committee, Telehealth and Assistive Technology, **2009**
- Member, International Programming Committee, Telehealth **2008**
- Session Chair, IACIS (International Association for Computer Information Systems) Conference **2007**
- Reviewer: 47th 48th 49th 50th Annual IACIS (International Association for Computer Information Systems) Fall Conference, **2007, 2008, 2009, 2010**
- Reviewer, **2010** International Conference on Computing, Communications, and Control Technologies (CCCT2010)
- Reviewer: research proposal – Ohio University, **2004**
- Member, IEEE, ACM, IEEE Computer Society

Administrative:

- Chair, Department of Computer Science and Information Technology, Kwantlen Polytechnic University, **2010-2015**
- Coordinator: program review – Bachelor of Technology in Information Technology, **2010-2013**
- Member, Faculty Council, School of Business, Kwantlen Polytechnic University, **2009-2013**
- Member, Research & Scholarship Committee, Kwantlen Polytechnic University, **2008**
- Member, Research Grant Committee, Kwantlen Polytechnic University, **2008**
- Member, Professional Development Committee, School of Business, Kwantlen Polytechnic University, **2009**
- Member, Student Awards Committee, School of Business, Kwantlen Polytechnic University, **2005**
- Member, Curriculum Committee, Department of Computing Science & Information Systems, Kwantlen Polytechnic University, **2010-2013**
- Member, Articulation Committee, Department of Computing Science & Information Systems, Kwantlen Polytechnic University, **2012-2014**
- Member, Selection Committee, Department of Information Technology, Kwantlen Polytechnic University
- Member, Academic Council, Gonzaga University, **2003-2004**
- Course convener, Computer Science, Langara College, **2001-2002**

AWARDS

- October 90 - October 93: Overseas Research Studentship (for Ph.D. studies) offered by the Committee of Vice Chancellors and Principals of the British Universities
- October 90 - October 93: IBM (UK) research sponsorship (for Ph.D. studies)
- Ph.D. work forms part of the material leading to a European research project "Neural Networks for System Identification and Control" (PSYCHO project, Contract No. BRE 2 CT94 0976, 160,000 Stirling pounds)
- Oct. 1989 - Sept. 1990: Sino-British Friendship Scholarship
- 1987 - Outstanding faculty award, Electrical Engineering Department, Hunan University, China

COMPUTER SKILLS

- Able to develop software using C/C++, C#, Java and OO concepts; assembly language (Intel and Motorola), XHTML/JavaScript, PHP/MYSQL, embedded system programming and Android app development
- Web design and web application development

- Able to work with Windows, UNIX/Linux, and Intel/Motorola hardware
- Familiar Microsoft Office Suite
- Working knowledge with Adobe Acrobat, Photoshop, Flash, Adobe Audition, Adobe Premiere, Dreamweaver
- Knowledge of industrial software development process

OTHER INFORMATION

- Languages: English - fluent; Chinese: native language
- Citizenship: CANADA
- Hobbies: Table Tennis