Hong Qiao

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Objective

Electrical engineer or research staff in the field of integrated optics or micro- and nanotechnology

Key Competencies

- Worked in the class 10 clean room and mastered most micro-opto-electro-mechanical system (MOEMS) technologies.
- Strong laboratory skills developed through research on ion-exchange waveguides, microfluidic channels and electrochromatic devices. Good at neat setup and precise measurement in optical experiments.
- Multidisciplinary background on physics, electronics, optics and MEMS. Adaptable to nanotechnology, thin film, CMOS, photonics, sensor and biomedical engineering.
- Strong analytical and problem solving skills, "Can do" attitude and good teamwork ability.

Education

Master of Science, May 2003 (expected)
Integrated Optics Laboratory
Electrical and Computer Engineering, University of Alberta, Edmonton, Canada
GPA: 8.5/9

Bachelor of Engineering, July 2000
Major: Physicoelectronics and Optoelectronics
Electronic Engineering, Tsinghua University, Beijing, China
GPA: 81/100

Experience

Research Assistant
University of Alberta, Edmonton, Canada (01/01– present)

- Degree project: Fabrication of Biochips with Integrated Micro-optics and Microfluidics.
- Conducted research in the NanoFab at the University of Alberta, considered the #1 micro- and nano-fabrication facility in Canada. Mastered the techniques of photolithography, wet etching, sputtering, thermal oxidation and ion-exchange diffusion. Trained to use inspection scanning electron microscope (SEM), optical profilometer and prism coupler. Expertise in glass substrate processing: cleaning, drilling, polishing, cleaving, dicing, annealing and thermal bonding.
- Improved the processes to fabricate multimode channel waveguides based on dry ion-exchange electromigration and to fabricate microfluidic channels.
- Designed and integrated micro-waveguides and microchannels on single substrates, and developed a novel microsystem which has potential applications to biomedical, chemical and environmental analysis, and optical sensors which involve small fluid samples.
- Improved a photomultiplier tube (PMT) measurement system controlled by a Labview software to capture pico-watt florescence signals.

Bachelor of Engineering Project
Tsinghua University, Beijing, China (03/00–07/00)

- Degree project: Study on the PMMA Organic Ion Conduction Layer in Electrochromatic Devices
- Investigated the chemical and machining characteristics of an organic material PMMA and the influence of PMMA coating methods on the optical and mechanical performances of an electrochromatic device.
- Designed and fabricated an electrochromatic device with the features of good mechanical strength, fixed organic ion conduction layer thickness, and high optical modulation ratio.

Electronic Techniques Practice
Electronic Workshop of Tsinghua University, Beijing, China (07/97)
- Learned to design, print, wire and solder circuit boards. Assembled an AM/FM radio and a multifunction charger.

Teaching Assistant
University of Alberta, Edmonton, Canada (09/01– 12/01)
- Evaluated the assignments of the course Electrical Circuits I.

Tutor
Individual students, Beijing, China (08/96–03/98)
- Tutored a junior college student in calculus.
- Tutored a high school student in physics and mathematics.
- Developed responsibility, work enthusiasm, and communication skills.

Relevant Courses

Microelectronics Process Technology	Thin Film Technology
Design CMOS Analog Integrated Circuit	Photonic Devices
Telecommunication Systems Engineering	Optical Fibre Communications
Introduction of Integrated Optoelectonics	Spectroscopy and Lasers
Solid state and Semiconductor Physics	Quantum Mechanics
Numerical Analysis and Algorithms	Electrodynamics

Computer Skills

- Layout editor software L-edit, technical computing language MATLAB, graphical programming language LabView, C language, Microsoft office software

Awards

- Mathematical Contest in Modeling, Third Prize, USA (02/99)
- Contest in Mathematical Modeling and Computer Application, Second Prize, Beijing, China (12/98)
- Excellent Freshman Fellowship, First Prize, Tsinghua University, Beijing, China (09/96)

Community Involvement

- IEEE student member
- CIPI (Canadian Institute for Photonic Innovations) student network
- Executive of Tsinghua University Mountaineering Expedition, in charge of promotion and publication of the club newspaper. Coordinated club meetings and recruitments. Actively involved in planning and organizing 2 snow mountaineering activities: the Muztagata (24741 feet, 1997), the Changtse (24731 feet, 1998). Team leader of an 8-member outdoor expedition activity
- Striker of the mixed soccer team Naboozers at University of Alberta

Publications and Presentations

- **H. Qiao**, A. Grundmann, S. Goel, J. N. McMullin, "Biophotonic Microsystems", the 6th International Conference on Optoelectronics, Fiber Optics and Photonics, Mumbai, India, December 16-18, 2002
- **H. Qiao**, S. Goel, A. Grundmann, J. N. McMullin, "Biochips with Integrated Optics and Fluidics", International Conference on Smart Materials Structures and Systems (ISSS-SPIE), Bangalore, India, December 12-14, 2002
- **H. Qiao**, S. Goel, A. Grundmann, J. N. McMullin, "Fabrication of Micro-optic/Microfluidic Biochips" (Paper and Presentation), the 5th International Conference on Application of Photonic Technology (ICAPT'2002), Quebec City, Canada, June 2-6, 2002
- **H. Qiao**, S. Goel, A. Grundmann, J. N. McMullin, "Microfluidic Biochips with Integrated Optics" (Poster), the 3rd Annual Meeting of the Canadian Institute for Photonic Innovations (CIPI), Quebec City, Canada, May 30-31, 2002
- **H. Qiao**, J. N. McMullin, A. Grundmann, "Microfluidic Biochips with Integrated Optics" (Presentation), the 2nd Alberta Biomedical Engineering Conference, Banff, Canada, October 26-28, 2001