Chao Liu

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Research Area

- 3D Micro and Nano Devices, Nanowires and Nanoparticles, Split Ring Resonators.

Education

- **University of Minnesota Twin Cities** — Minneapolis, United States
  M.S. Electrical Engineering — Sept. 2013 – Present
- **North University of China** — Taiyuan, China
  B.S. Microelectronics — Sept. 2009 – Jun. 2013
  - GPA: 88.40/100
  - Major GPA: 89.87/100

Professional Experience

- **Research Assistant** — University of Minnesota Twin Cities
  Prof. Jeong Hyun Cho's Research Group — Sep. 2013 – Present
  - Research on Split Ring Resonator with CST and HFSS simulation.
  - Research on Microfabrication of Metallic Nanoparticle Array.
- **Research Assistant** — North University of China
  Micro Waveguide Research Group — Aug. 2012 – June. 2013
  - Studied principles of silicon photonic and optical MEMS.
  - Investigated new methods to design optical gyroscope via Sagnac effect and Electromagnetically Induced Transparency
  - Simulated micro-ring resonator with different sizes via OptiFDTD software
  - Tested the micro waveguide and resonator structures on chip. Documented the test result and calculated the Q value.
  - Compared and analyzed factors related with Q value and devised a new methodology to fabricate high-Q optical MEMS device.
- **Research Assistant** — North University of China
  Energy Harvesting System For Underwater MEMS Sensors — Sep. 2012 – June. 2013
  - Investigated the development of MEMS energy harvesting technology.
  - Studied energy harvest based on thin film piezoelectric material.
  - designed MEMS energy harvesting system for underwater MEMS sensors using energy harvesting eel.
  - Wrote a report of MEMS energy harvesting system for underwater Sound tranducer to apply for National Nature Science Foundation of China(NSFC).
- **Research Assistant** — North University of China
  Optical Biochemical Sensor Group — Sep. 2012 – Oct. 2012
  - Investigated the application of optical MEMS structures in biosensing.
  - Modified silicon surface with aqueous solutions of APTS to form an APTS monolayer.
  - Tested the surface roughness, contact angle and component of different sample surfaces to determine the best solvent for silicon surface modification.

- Researched on biological sensors for quantitative analysis of glucose.
- Helped editing papers about silicon surface modification and biological sensor.

Undergraduate Project Experience

- **Structural Design and Simulation of Tunneling Accelerometer** Aug. 2011 – Apr. 2012
  - Designed a four-cantilever structure for tunneling silicon micro-accelerometer. Calculated the sizes of each part of the structure.
  - Simulated the designed structure in ANSYS to study the beam deformation under load. Calculated six mode shapes though modal analysis.
  - Proposed an optimized solution for accelerometer structures to gain higher sensitivity and stability.

Intern Experience

- **Electronic and Electrical Process Intern** North University of China
  Engineering Training Center Jun. 2011
  - Studied basic electronic and electrical process.
  - Made a DC stabilized power supply circuit and a portable radio circuit. Tested and debugged these electrical circuits.

Publications

- Jingxue Wang, Chenyang Xue, **Chao Liu**, Yonghua Wang. **The Research of APTES Modification on Silicon Structure Surface based on Planar Waveguide**[J]. Journal of Transduction Technology *Sep. 2012*.
- Junbin Zang, Chenyang Xue, Yujian Jin, Xiaogang Tong, Liping Wei, **Chao Liu**. **Analysis and test of nano-optical waveguide surface roughness and scattering loss**[J]. Tranducer and Microsystem Technologies *Jun. 2012*.
- **Chao Liu**, Chenyang Xue, Danfeng Cui, Junbin Zang, Yonghua Wang, Jingxue Wang. **High-Q silicon-on-insulator micro-ring resonator with Silica covering**[C]. The 2013 2nd International Conference on Applied Materials and Electronics Engineering (AMEE 2013) *Nov. 2012*.
- Chenyang Xue, Jingxue Wang, **Chao Liu**, Yonghua Wang, Danfeng Cui, Wendong Zhang. **Research on Optical Biological Sensor used as Quantitative Analysis of Glucose**[C]. The IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE-NEMS) *Nov. 2012*.
- Danfeng Cui, Chenyang Xue, **Chao Liu**, Liping Wei, Yonghua Wang, Jun Liu. **Induced-Transparency in Silicon-on-Insulator based Novel Resonator Systems**[C]. The IEEE International Conference on Nano/Micro Engineered and Molecular Systems (IEEE-NEMS) *Nov. 2012*.
- Zang Junbin, Xue Chenyang, Wei Liping, **Liu Chao**, Danfeng Cui, Yonghua Wang, Wendong Zhang. **The resonance frequency shift in an SOI nano-waveguide microring resonator**[J]. Journal of Semiconductors *Apr. 2013*.

Other Activities

- **New Oriental North American Summit Forum** Taiyuan, China
  Student representative May. 2012

- Made a presentation about the preparation of the TOEFL examination.
- Exchanged experience of studying abroad with parents and other students.

Skills

- **Language:** TOEFL(Reading 25, Listening 28, Speaking 23, Writing 28, Total 104)
- **Programming:** C Language, VHDL, L-Edit, ANSYS, HSPICE, Cadence, OptiFDTD, CST, HFSS
- **Documentation:** MS Office, LaTeX, Microsoft Office Visio, Origin
- **Instrument:** Oscilloscope, Infrared/Optical CCD Camera, Manual/Motorized Positioner

Awards and Honors

Second Prize Scholarship 2010/2011
Merit Student 2010/2011
Second Prize Scholarship 2011/2012