

# Yan Xie

2964S 200E, Salt Lake City, UT, 84115  
(216)659-4356 | somewhat7@gmail.com

## EDUCATION

---

Aug. 2008	<b>CASE WESTERN RESERVE UNIVERSITY</b> <b>Ph.D</b> , Electrical Engineering and Computer Science	Cleveland, OH
Jan 2006	<b>CASE WESTERN RESERVE UNIVERSITY</b> <b>Master of Science</b> , Electrical Engineering and Computer Science	Cleveland, OH
July 2001	<b>SHANGHAI JIAOTONG UNIVERSITY</b> <b>Bachelor of Science</b> , Precision Instrument Engineering	Shanghai, China

## SUMMARY OF QUALIFICATIONS

---

- Extensive experience in MEMS device design, fabrication and characterization in clean-room environment.
- Capability of trouble-shooting and MEMS process optimization.
- Years experience in designing, fabricating and testing point of care microfluidic devices for biological applications based on PDMS soft-lithography method.
- Experience in board level analog and digital circuit design and testing.
- Experience in software programming with LabVIEW and C for testing system control.

## TECHNICAL SKILLS

---

<b>Design &amp; Simulation:</b>	L-Edit (MEMS PRO) <sup>TM</sup> , AutoCAD, Matlab, LabVIEW, C, SPICE, Supreme3.
<b>Fabrication:</b>	Photolithography, Thin film deposition (APCVD, LPCVD, PECVD, e-beam, sputtering), Dry etching (RIE, DRIE), Wet etching (metal, silicon, PSG, thermal oxide), Wafer dicing, PDMS processed Lab-on-a-chip.
<b>Device Characterization:</b>	SEM, AFM, signal generator, oscilloscope, semiconductor analyzer, spectral analyzer, FIB, fluorescence microscope, IV-CV probe station, ellipsometer, profilometer, Nanospec.

## RESEARCH EXPERIENCE

---

Feb 2009- now	<b>UNIVERSITY OF UTAH</b> <i>Postdoc Research Assistant</i>	Salt lake city, UT
	<ul style="list-style-type: none"><li>• Tip based nanofabrication with plasma nanotorch--fabricated plasma nanotorch tips capable of forming extremely localized Plasma-deposition and etching of electronic materials using the method of surface micromaching. The whole structure is suspended on a silicon nitride cantilever and includes three subcomponents: a microchannel that ensures a continuous transfer of reactive species; a refractory metal coated tip for the generation of highly localized electric fields; two polysilicon piezoresistors alongside the microchannel for the sensing of tip deflection. The whole fabrication processes involve the deposition and patterning of silicon nitride, polysilicon, thermal oxide, PSG, Cr, Au, Al, polyimide; dry etching (plasma, DRIE)</li></ul>	

of silicon nitride, polysilicon, thermal oxide, polyimide; wet etching of polysilicon, thermal oxide, PSG, Cr, Au, Al, polyimide and other microfabrication techniques.

August 2008-  
Jan. 2009 **GEORGIA INSTITUTE OF TECHNOLOGY** Atlanta, GA  
*Postdoc Research Assistant (Hang Lu' Microfluidic Lab)*

- Microfluidic approach to genetic and small molecule screens (using caenorhabditis elegans).
  - Genetic screen to identify genes involved in learning and memory;
  - Genetic screen to identify genes involved in fat/lipid regulation;
  - Screen for combinations of sex/dauer pheromones and figuring out the mechanisms of how they interact with the nervous systems.

July 2006-  
August 2008 **CASE WESTERN RESERVE UNIVERSITY** Cleveland, OH  
*Graduate Research Assistant (Carlos' Microfluidic Lab)*

- Conceptualized and implemented a novel microfluidic theory -- "Fourier Microfluidics" for biomedical signal processing. Based on this theory, frequency domain microfluidic band-pass filters, delay line filters, and frequency selective filters with variable center frequency have been designed, fabricated and analyzed. These novel microfluidic devices have the ability of separating chemical molecules based on their frequency domain characteristics and are especially powerful in the acquisition and analysis of dynamic chemical signals, such as cellular signaling, secretion of nutrients and metabolites.
- Evaluated and optimized key microfluidic components for rapid chemical signal processing and large scale integration microfluidic devices. (1) Engineered a novel tiling mixer module for Lab-on-a-chip and constructed high speed sequential micromixer achieving fast mixing within 1  $\mu\text{m}$ . (2) Implemented One-Lambda (Minimum printing Resolution) Teflon-Seated Microvalves for PDMS chips. This valve has a small area of  $25 \times 25 \mu\text{m}^2$  and is ideal for large scale integrated microfluidic devices.
- Constructed a PCM-Programmable Arbitrary Gradient Generator for Cell Chemotaxis.
- Developed a novel ion spectroscopy technology using microfluidic flowFETs for species detection and discrimination.

Jan 2004-  
June 2006 **CASE WESTERN RESERVE UNIVERSITY** Cleveland, OH  
*Graduate research Assistant (Solid State and Microelectronic Lab)*

- Constructed copper sulfide based non-volatile solid electrolyte memory devices.
- Manufactured metal-catalyzed carbon nanotube piezoresistors with very large longitudinal piezoresistivity.
- Completed and verified sensitive  $\text{NH}_3$  and HCl gas sensors utilizing self-aligned and self-welded multi-walled carbon nanotube bridges.

## INDUSTRY EXPERIENCE

---

Nov 2001-  
Dec 2003 **SONY CORPORATION** Tokyo, Japan  
*Hardware Engineer*

- Designed 16 bit CD quality stereo sound system (AC97 compatible) for VAIO notebook PC model PCG-Z1 using YAMAHA YMF 753-S audio codec.
- Took charge of the audio system design for VAIO OEM notebook PC model PCG-GR (Sigmatel STAC9750): testing audio system quality of the PC sent from OEM (BenQ), and contacting with corresponding people for necessary audio system circuit modification.
- Designed sound system (sound card, output, input connectors) for VAIO desktop PC model VGX-XL using Sigmatel high definition audio codec CDX9872RD. This was the first VAIO model that supports 5.1 sound playback.

## HONORS AND AWARDS

---

- Case prime fellowship, 2004-2008.
- Finalist of Best paper, IEEE NEMS, 2008
- Academic travel award, Case Graduate School, 2007
- LISSA travel grant, IEEE-NIH Life Science System and Applications Workshop, 2007

## LANGUAGE

---

English, Japanese, Mandarin, Cantonese; Level: Fluency in listening, speaking, reading, and writing.

## SELECTED PUBLICATIONS (totally 1 book, 2 journal papers and 15 conference)

---

**Yan Xie**, Carlos H. Mastrangelo, “Chemical Signal Analysis with Fourier Microfluidics—concepts and methods”, VDM Verlag Dr. Muller Aktiengesellschaft & Co. KG, 2009.

**Yan Xie**, Yingying Wang, Li Chen, Carlos H. Mastrangelo, “Fourier Microfluidics”, Lab Chip, 2008, **8**, 779-785.

Massood Tabib-Azar, **Yan Xie**, “Sensitive NH<sub>3</sub>OH and HCl Gas Sensors Using Self-aligned and Self-welded Multiwalled Carbon Nanotubes”, IEEE Sensors, Vol. 7, No.10, pp. 1435-1439, Oct. 2007.

**Yan Xie**, Yingying Wang, Farouk Azizi, Carlos H. Mastrangelo, “PCM-Programmable Arbitrary Gradient Generator for Cell Chemotaxis”, Proceedings of the 12<sup>th</sup> International Conference on Miniaturized Systems for Chemistry and Life Sciences, Oct. 12-16, 2008, San Diego, USA.

**Yan Xie**, Yingying Wang, Farouk Azizi, Carlos H. Mastrangelo, “One-Lambda Teflon-Seated Microvalves for PDMS chips”, Proceedings of IEEE Biomedical Circuits and Systems Conference, November 20-22, 2008, Baltimore, MD.

**Yan Xie**, Farouk Azizi, Carlos H. Mastrangelo, “Fast Bowtie Junction Microfluidic Multiplexers”, Proceedings of the 22<sup>th</sup> International Conference EUROSENSORS, Sep. 07-10, 2008, Dresden, Germany.

**Yan Xie**, Farouk Azizi, Carlos H. Mastrangelo, “Frequency-Selective Filtering with Variable Center Frequency for Dynamic Chemical Signals”, Proceedings of the 22<sup>nd</sup> International Symposium on Microscale Bioseparations & Methods for Systems Biology”, March. 9-13, 2008, Berlin, Germany.

**Yan Xie**, Yingying Wang, Carlos H. Mastrangelo, “Spectral Discrimination of Dynamical Chemical Signals with Fourier Microfluidics”, Proceedings of the 3<sup>rd</sup> IEEE-NIH Life Science System and Applications Workshop, Nov. 8-9, 2007, Bethesda, Maryland.

**Yan Xie**, Yingying Wang, Farouk Azizi, Li Chen, Carlos H. Mastrangelo, “An On-Chip Continuous-Flow Sequential Tiling Micromixer”, Proceedings of the 11<sup>th</sup> International Conference on Miniaturized Systems for Chemistry and Life Sciences, Oct. 7-11, 2007, Paris, France.

**Yan Xie**, Yingying Wang, Li Chen, Carlos H. Mastrangelo, “Spectral Separations of Chemical Signals with Fourier Microfluidics”, Proceedings of the 11<sup>th</sup> International Conference on Miniaturized Systems for Chemistry and Life Sciences, Oct. 7-11, 2007, Paris, France.

**Yan Xie**, Massood Tabib-Azar, “Telescoping Self-Aligned Metal-Catalyzed Carbon Nanotube Piezoresistors As Stain Gauges”, Proceedings of the 5<sup>th</sup> IEEE Conference on Sensors, pp. 1407-1410, Oct. 22-25, 2006, Daegu, Korean.

Massood Tabib-Azar, **Yan Xie**, “Sensitive NH<sub>3</sub>OH and HCl Gas Sensors Using Self-aligned and Self-welded Multiwalled Carbon Nanotubes”, Proceedings of the 4<sup>th</sup> IEEE Conference on Sensors, pp. 1316-1319, Oct. 31-Nov. 3, 2005, Irvine, California.