LIANG ZHOU

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HIGHLIGHTS

- 10+ years of hands-on experience in MEMS design and fabrication
- Highly skilled in new actuator design, structure analysis, and process integration & development
- Knowledgeable in experimental design, optics, semiconductor, electronics, and mechanics

EDUCATION

Ph.D., Electrical & Computer Engineering **08/2015 – 12/2020**
University of Florida, Gainesville, FL

Ph.D. Candidate, Mechanical Engineering **08/2012 – 06/2015**
Stevens Institute of Technology, Hoboken, NJ

M.E., Microelectronics and Solid State Electronics **09/2007 – 07/2010**
Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences

B.E., Automation (Computer Control) **09/2002 – 07/2006**
Dong Hua University, Shanghai, China

WORK EXPERIENCE

Research Assistant **08/2015 – 12/2020**
University of Florida

- Designed and fabricated novel electrothermal MEMS lens scanners for axial optical scan
- Developed and optimized unique MEMS processes to eliminate warpage, increase yields, and enhance robustness and reliability
- Conducted thermo-mechanical analysis to localize overheating and optimize temperature distribution on electrothermal microactuators
- Developed and characterized MEMS based fiber scanners, MEMS in liquid, hybrid electrostatic and electrothermal MEMS, and integrated silicon optical bench
- Designed miniature MEMS-based fiber-optic two-photon microscopy probes towards miniature/wearable head-mounted microscopes

Research Assistant **09/2012 – 06/2015**
Stevens Institute of Technology

- Fabricated piezoelectric nanofibers via electrospinning with synthesized Barium Titanate sol-gel
- Characterized thermoelectric and piezoelectric nanofibers using MEMS test platforms
- Designed flexible generators and surface acoustic wave (SAW) devices

MEMS Design Engineer **03/2011 – 08/2012**

Wuxi WiO Technology Co., Ltd., Wuxi, China

- Designed large aperture electrothermal MEMS micromirror arrays for OXC
- Designed integrated silicon optical benches with MEMS mirrors for OCT probes
- Optimized packaging and characterization of MEMS mirrors
- Achieved multiple patents for novel designs and applications of MEMS Mirrors

Research Assistant **09/2007 – 07/2010**

Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences

- Developed carbon MEMS processes and fabricated flexible carbon-film microelectrode arrays for neural stimulation
- Designed and fabricated elastic microelectrodes and 3D micro/nanoelectrodes
- Characterization of microelectrodes and optimized their connection to peripheral devices

Physical Design Engineer (ASIC) **06/2006 – 06/2007**

Fortemedia Inc., Shanghai, China

- Designed layout of digital and analog IC modules

KEY TECHNICAL SKILLS

MEMS Design: COMSOL Multiphysics, L-edit, KLayout, Laker, SolidWorks

Optic Design: Code V, Zemax

Microfabrication: Photolithography, PVD (Sputtering, E-beam Evaporation), PECVD, Dry Etching (DRIE, RIE, Asher, XeF_2), Wet Etching, Electroplating, Wire Bonding, Hot Processing (RTA, Oxidization, Doping), Critical Point Drying, 3D Printing, Electrospinning

Characterization: SEM, AFM (Piezo-AFM), XRD (SAXS), Probe Station, Optical/Stylus Profilometer, Film Stress, Photospectrometer/Filmetrics, Network Analyzer, Semiconductor Parameter Analyzer

Data Analysis: JMP, Image J, Python, Matlab, C

SELECTED PATENTS (US:1; CN: 13)

[1] H Xie, S Koppal, X Zhang, **L Zhou**, and C Duan. Endoscopic OCT Probes with Immersed MEMS Mirrors. US20190150715A1 (*US*).

[2] H Xie, **L Zhou**, and Q Chen. A device with tilt-tunable MEMS Micromirrors. ZL201210397690X (*CN*)

[3] **L Zhou**, Q Chen, and H Xie. Manufacturing method of a self-tilted MEMS micromirror. ZL2013103360339 (*CN*)

[4] G Li, Z Zhu, **L Zhou**, and J Zhao. Flexible neural microelectrode arrays based on carbon film and manufacturing method thereof. ZL 2011100564087 (*CN*)

JOURNAL PAPERS

[1] **Zhou L**, Yu X, Feng PX-L, Li J, Xie H. A MEMS lens scanner based on serpentine electrothermal bimorph actuators for large axial tuning. *Optics Express*. 2020 (IF: 3.950)

[2] **Zhou L**, Zhang X, Xie H. An Electrothermal Cu/W Bimorph Tip-Tilt-Piston MEMS Mirror with High Reliability. *Micromachines*. 2019 (IF: 2.222)

[3] Park H-C, Zhang X, Yuan W, **Zhou L**, Xie H, Li X. Ultralow-voltage electrothermal MEMS based

fiber-optic scanning probe for forward-viewing endoscopic OCT. *Optics Letters* 2019 (IF: 3.714)

[4] Luo S, Wang D, Tang J, **Zhou L**, Duan C, Wang D, Liu H, Zhu Y, Li G, Zhao H, Wu Y, An X, Li X, Liu Y, Huo L, Xie H. Circumferential-scanning endoscopic optical coherence tomography probe based on a circular array of six 2-axis MEMS mirrors. *Biomedical Optics Express*. 2018 (IF: 3.921)

[5] Cheng X, Sun X, Liu Y, Zhu L, Zhang X, **Zhou L**, Xie H. Integrated Optoelectronic Position Sensor for Scanning Micromirrors. *Sensors*. 2018 (IF: 3.275)

[6] Luo S, **Zhou L**, Wang D, Duan C, Liu H, Zhu Y, Li G, Tang J, Wu Y, An X, Li X, Liu Y, Xie H, Huo L. A Miniature Endoscopic Optical Coherence Tomography Probe Based on C-Lens. *IEEE Photonics Journal.* 2018 (IF: 2.740)

[7] Luo S, Guo Q, Zhao H, An X, **Zhou L**, Xie H, Tang J, Wang X, Chen H, Huo L. Noise Reduction of Swept-Source Optical Coherence Tomography via Compressed Sensing. IEEE Photonics Journal. 2018 (IF: 2.740)

[8] Wang H, **Zhou L**, Zhang X, Xie H. Thermal Reliability Study of an Electrothermal MEMS Mirror. *IEEE Transactions Device and Material Reliability.* 2018. (IF: 1.407)

[9] Duan C, Wang W, Zhang X, **Zhou L**, Pozzi A, Xie H. A Self-Aligned 45°-Tilted Two-Axis Scanning Micromirror for Side-View Imaging. *Journal of Microelectromechanical Systems.* 2016 (IF: 2.534)

[10] Zhang X, Koppal S, Zhang R, **Zhou L**, Butler E, Xie H. Wide-angle structured light with a scanning MEMS mirror in liquid. *Optics Express*. 2016 (IF: 3.950)

[11] Zhang X, Zhou L, Xie H. A Fast, Large-Stroke Electrothermal MEMS Mirror Based on Cu/W Bimorph. *Micromachines*. 2015 (IF: 2.222)

BOOK CHAPTER

[1] Xie H, Zhang X, **Zhou L**, Pal S. Electrothermally actuated MEMS mirrors. In: *Zhou G, Lee C, editors. Optical MEMS, Nanophotonics, and Their Applications*. 1st ed. CRC Press; 2017

SELECTED CONFERENCE PAPERS (9/13)

[1] **Zhou L**, Yu X, Xie H. A Robust Compact Lens Scanner with Large Tunable Range. *33rd IEEE MEMS 2020*. Vancouver, BC, Canada

[2] **Zhou L**, Chen Y, Chen X, Hao Y, Coleman JE, Xie H. Development of an electrothermal MEMS mirror based two-photon microscopy probe. *Multiphoton Microscopy in the Biomedical Sciences XIX.* 2019 SPIE

[3] **Zhou L**, Wang D, Xie H. An Electrothermal Micromirror with J-shaped Bimorph Microactuators. *IEEE Optical MEMS and Nanophotonics (OMN) 2019.* Daejeon, Korea (South).

[4] **Zhou L**, Li Z, Liang M, Chen Y, Zhang X, Xie H. A fiber scanner based on a robust Cu/W bimorph electrothermal MEMS stage. *SPIE MOEMS and Miniaturized Systems XVIII 2019. San Francisco,* United States.

[5] **Zhou L**, Xie H. A Novel Out-of-Plane Electrothermal Bistable Microactuator. *IEEE 20th TRANSDUCERS & EUROSENSORS XXXIII 2019.* Berlin, Germany.

[6] **Zhou L**, Zhang X, Sung Y, Shih W-C, Xie H. A Miniature Lens Scanner with an Electrothermally-Actuated Micro-Stage. *IEEE OMN 2018*. Lausanne, Switzerland.

[7] Wang W, Chen Q, Wang D, **Zhou L**, Xie H. A bi-directional large-stroke electrothermal MEMS mirror with minimal thermal and temporal drift. *30th IEEE MEMS 2017*. Las Vegas, NV, USA.

[8] Zhang X, **Zhou L**, Xie H. A large range micro-XZ-stage with monolithic integration of electrothermal bimorph actuators and electrostatic comb drives. *29th IEEE MEMS 2016.* Shanghai, China

[9] **Zhou L**, Zhang G, Galos R, Shi Y, Fabrication and characterization of Barium Titanate nanofibers." *10th IEEE NEMS* 2015. Xi'an, China