

MINCHUL SHIN
Georgia Southern University
P.O. Box 8045, Statesboro, GA 30460

Office: (912) 478-5759

mshin@georgiasouthern.edu

PRIMARY AREA OF INTEREST

Mechatronics, MEMS and nanotechnology (Fabrication and design). Special topics are electromechanical systems including micro-robots, acoustic sensor, and actuators. Also interested in mechanical measurements, experimental methods and electronics for measurement.

PROFESSIONAL EXPERIENCE

GEORGIA SOUTHERN UNIVERSITY, Statesboro, GA
Assistant Professor

August 2014 - Present

Teaching and research in the areas of mechatronics, microsystems, dynamics, vibration, and controls. Research interests include micro- and nano- fabrication, micro-robotics, acoustic sensor, and biomimetic design.

UNIVERSITY OF MICHIGAN, Ann Arbor, MI
Postdoctoral Fellow

January 2013 - March 2014

Development of prototype micro-robots and micro-robotic appendages integrating thin-film piezoelectric actuation with high aspect-ratio polymer microstructures. Experimental measurements of parylene properties including adhesion to high-aspect ratio silicon structures, stiffness and damping properties at various strain rates, and stiffness and damping properties following plastic yield.

TUFTS UNIVERSITY, Medford, MA
Graduate Assistant (Vibration and Acoustics Laboratory)

September 2008 - August 2012

Development of a small acoustic Doppler velocity measurement system; utilized MEMS capacitive micromachined ultrasound transducer (cMUT) array technology. Participation in research on several topics with an emphasis on microfabrication including bimaterial micro actuator.

PUBLICATIONS

Gomez, A., **Shin, M.*** "3D structure development using 3 layer Self-folding technology". Under review.

Li, L., Lu, B., Jiang, D., **Shin, M.**, Kelley, T., Burgess, J. "Cell Plasma membrane Cholesterol as a Diagnostic" *Current Opinion in Electrochemistry* (2017) 2: 82- 87

Choi, J., **Shin, M.**, Rudy, R., Kao, C., Pulskamp, J., Polcawich, R., Oldham, K. "Thin-film piezoelectric and high-aspect ratio polymer leg mechanisms for millimeter-scale robotics". Int J Intell Robot Appl (2017) 1:180-194

Shin, M., Zhao, Z., DeBitteto, P., and White, R. D. "Acoustic Velocity Measurement System Using cMUT technology and a Nickel-on-Glass Process". Sensors and Actuators A: Physical, 208, pp37-49, 2014

Zhao, Z., **Shin, M.**, Gallman, J. M., and White, R. D. "A Microfabricated Shear Sensor Array on a Chip with Pressure Gradient Calibration". Sensors and Actuators A: Physical, 205, pp. 133-142, 2014

Shin, M., Krause, J., DeBitteto, P., and White, R. D. "Acoustic Doppler Velocity Measurement System using Capacitive Micromachined Ultrasound Transducer Array Technology". The Journal of the Acoustical Society of America, 134 (2), pp. 1011-1020, 2013.

Shin, M., Gerratt, A. P., Metallo, C., Brindle, A., Kierstead, B. P., and White, R. D. "Characterization of a Micromachined Parylene Based Thermal Actuator". Journal of Micromechanics and Microengineering, 21 (995028), 2011.

White, R. D., Mueller, A. J., **Shin, M.**, Manno, V. P., and Rogers, C. B. "Measurement of Microscale Shear Forces during Chemical Mechanical Planarization", Journal of the Electrochemical Society, 158 (10), pp. H1041-H1051, 2011.

PRESENTATIONS

Shin, M., Zhao, Z., DeBitteto, P., White, R. D. "Capacitive Micromachined Ultrasound Doppler Velocity Sensor using a Nickel on Glass Process". Presentation at the 164th Meeting of the Acoustical Society of America. June 2012.

Shin, M., Krause, J., DeBitteto, P., and White, R. D. "Capacitive Micromachined Ultrasound Doppler Velocity Sensor". Presentation at 161st Meeting of the Acoustical Society of America, Seattle. May 2011.

White, R. D., Zhao, Z., **Shin, M.**, Krause, J. S., and Liu, S. "Nickel on Glass Acoustic Microsystems" Presentation at the 162nd meeting of the Acoustical Society of America, San Diego. November 2011.

Shin, M., Vlahakis, J., Manno, V.P., Rogers, C., Paul, E., Moinpour, M., Hooper, D., and White, R.D. "In Situ Metrology for Glass and Copper CMP". International Conference on Planarization/CMP Technology. ICPT 2009, Fukuoka, Japan, November 2009.

Shin, M., Vlahakis, J., Gray, C., Braun, N., Gauthier, D., White, R. D., Rogers, C., Manno, V. "In Situ Coupled with Modeling to Improve Control and Operation of CMP Processes". SRC/Sematech Engineering Research Center on Environmentally Benign Semiconductor Manufacturing, Tucson, AZ. February 2009.

Shin, M., Brott, B.C., Lloyd S.G., Evanochko, W.T., Kiss, P., Baker, R.A., Anayiotos, A.S. "MRI Evaluation of a Stented Abdominal Aorta in a Rabbit". Presentation at 2007 Summer Bioengineering Conference. Keystone, CO. June 2007.

EDUCATION

TUFTS UNIVERSITY, Medford, MA

Ph.D. in Mechanical Engineering, August 2012
Specialization in Microelectromechanical Systems (MEMS)

UNIVERSITY OF ALABAMA, Birmingham, AL

M.S. in Biomedical Engineering, July 2007

KYUNGPOOK NATIONAL UNIVERSITY, Daegu, South Korea

B.S. in Mechanical Engineering, February 2005