WUYANG YU

ywy1217@gmail.com | ywy1217.github.io/yuwuyang/

Education

08/2012 – 08/2018 Ph.D. in Electrical and Computer Engineering – GPA 3.87/4
PURDUE UNIVERSITY – West Lafayette, IN, USA
- Advisor: Prof. Babak Ziaie

08/2008 – 07/2012 Bachelor of Science in Microelectronics – GPA 91.9/100
TSINGHUA UNIVERSITY – Beijing, China

Work and Research Experience

Sensor Systems Engineer *Zoox*

01/2022 – present **Sensor Systems Architecture and Hardware Requirements**

- Develop TOF sensor end-to-end simulation and signal processing algorithms (MATLAB).
- DFMEA and validation plans for next-gen TOF sensor.
- Derive top-down hardware requirements with Perception stack sensitivity analysis (C++, Python).
- Define lidar roadmap and new technology evaluation.
- Sensor coverage and redundancy analysis (Blender, Python).

Sensor Design & Integration Engineer *Apple*

10/2018 – 01/2022 **iPhone Touch & Force Sensor Technologies**

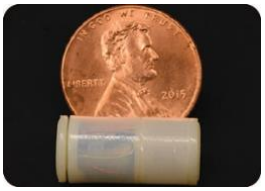
- Development of sensing solutions from concept through product release (iPhone 12 portfolio).
- Propose/design/build/measure prototype sensing solutions that demonstrate architecture feasibility.
- Sensor modeling (AFE, DSP), optimization, and validation frameworks (MATLAB, Python, C).
- Define calibration, test, and reliability methodology/requirements across the supply chain.
- Cross-disciplinary experience in ASIC/firmware/algorithm/mechanical/system integration
- Design schematics and provide layout constraints for PCBs/FPCs.
- Analyze engineering build data (JMP) and assess process capability.
- Perform failure mode analysis, root-cause diagnosis, and technical problem-solving.
- Align/engage external partners and suppliers, including design, bring up, FACA, etc.
- Author hardware specifications, engineering build documentation and executive communications.

Graduate Research Assistant *Ziaie Biomedical Microdevices Laboratory, Purdue University*

09/2014 – 07/2018 **Autonomous diaper-embedded photometric sensing platform with on-board urine-activated battery for urinary tract disease screening** (*Ph.D. Dissertation*)

- System architecture design: system wakes upon urine activating the battery; urine is transported to optical sensing module; infection-correlated urine color change is detected based on colorimetric absorption; thin and conformal platform substrate for diaper embedding
  - Design and characterization of disposable urine-activated battery: activation time; discharging capacity; geometry optimization
  - Fluid transport timing control: capillary flow study in confined porous medium
  - Sensor modeling and calibration algorithm to compensate for the variation of light absorption process in porous medium in various hydrated states;
- Fabrication process design: laser patterning polymeric films and metallic sheets; integration of electronics with polymeric substrate and paper-based battery; device packaging
- Commercialization activities: product demo; manufacturing cost estimate

01/2014 – 05/2017 **Magnetically-activated capsule for gastrointestinal tract location-specific drug release**



- System design and feasibility study of an edible-size smart capsule
  - Magnetic-activated-fusible latch design for non-invasive targeted release
  - Characterization of 3D magnetic activation range v.s. external trigger deployment
  - Heat source (supercapacitor) and fuse (NiCr) selection with dimension constraints
  - Prototyping: Solidworks design; laser machining/3D-printing; assembly process design
- Integrated wireless charging capability
- In-vitro study on the performance and reliability

03/2013 – 02/2018 **Stretchable/flexible interconnect, strain sensors and electrochemical sensors**

- Contributed to multiple other projects involving stretchable flexible interconnect and sensors for wearable and precision agriculture applications
- Fabrication process innovation around various elastomers and conductive/degradable polymers
- Hands-on experience in rapid prototyping of sensor parts, test fixtures and fabrication tools/molds.
- Hands-on experience with electrical and mechanical test instruments, such as oscilloscope, spectrum analyzer, USB DAQ, etc.
- Hands-on experience with test automation
- Working experience of electrochemistry around potentiometric sensors, metal-air batteries, electroplating and etching

04/2016 – 07/2018 **Research group website management – https://engineering.purdue.edu/ZBML/**

- Modernized website style using open-source Bootstrap template.
- Created MySQL database for managing publication records and project information.
- Created interactive visualization (keyword cloud) of highlighted research topics using JS/PHP.

Graduate Teaching Assistant *Department of Mathematics, Purdue University*

08/2016 – 12/2016 Prepared online (Lon-capa) homework and solutions for course (MATH373 Financial Mathematics) using HTML/Perl/LaTeX.

Undergraduate Thesis *M. AI. N (MEMS, Advanced Integration, Nanotechnology) Group, Tsinghua University*

03/2012 – 06/2012 **Thermal stress analysis on through-silicon-vias (TSVs) with liners of different materials**

Created FEA models in ANSYS to simulate thermal stress mitigation by the liners made of different materials (SiO_2, BCB, air, etc.) between copper via and silicon wafer.

Skills

Programming MATLAB, Python, C/C++, HTML/JS/PHP/MySQL

Simulation SPICE, Multisim, ANSYS

Graphic design Solidworks, CorelDRAW, Adobe Illustrator/Photoshop (for both CAD designs and graphic illustrations in technical documentation)

Data analysis JMP, Origin (statistical analysis and visualization)

Rapid prototyping Laser Machining, SLA and Extrusion 3D printing, Soft Lithography, PCB Design and Etching

Others Electrical measurements (multimeter, oscilloscope, LCR meter, network analyzer, Multifunction I/O DAQ), UV-Vis Spectroscopy, Electrochemistry

Scholarship & Awards

2009 – 2011 Academic Merit Scholarship / *Zheng Geru* Scholarship, *Tsinghua University*
2010 *Li & Fung* scholarship, (for exchange study at the University of Hong Kong)
2009 First prize of Beijing University Student Physics Competition, Non-physical Group A
2007 First prize of China Physics Olympiad (CPHO) for high school students, *Jiangxi* Province

Publications – 8 journal publications, 11 conference publications & 2 patents

Journal

- H. Jiang, M. Ochoa, R. Rahimi, **W. Yu**, et al. "Laser-treated glass platform for rapid wicking-driven transport and particle separation in bio microfluidics." *RSC Advances* 9.34 (2019): 19531-19538.
- H. Jiang, **W. Yu**, et al. "A Smart Capsule with a Hydrogel-Based pH-Triggered Release Switch for GI-Tract Site-Specific Drug Delivery." *IEEE Transactions on Biomedical Engineering* (2018).
- W. Seo, **W. Yu**, et al. "Diaper-Embedded Urinary Tract Infection Monitoring Sensor Module Powered by Urine-Activated Batteries." *IEEE transactions on biomedical circuits and systems* 11.3 (2017): 681-691.
- R. Rahimi, **W. Yu**, et al. "Directly embroidered microtubes for fluid transport in wearable applications." *Lab on a Chip* 17.9 (2017): 1585-1593.
- **W. Yu**, et al. "A Smart Capsule With GI-Tract-Location-Specific Payload Release." *IEEE Transactions on Biomedical Engineering* 62.9 (2015): 2289-2295.

- R. Rahimi, M. Ochoa, **W. Yu**, et al. "Highly stretchable and sensitive unidirectional strain sensor via laser carbonization." *ACS applied materials & interfaces* 7.8 (2015): 4463-4470.
- R. Rahimi, M. Ochoa, **W. Yu**, et al. "A sewing-enabled stitch-and-transfer method for robust, ultra-stretchable, conductive interconnects." *Journal of Micromechanics and Microengineering* 24.9 (2014): 095018.
- Q. Chen, **W. Yu**, et al. "Reliability of through-silicon-vias (TSVs) with benzocyclobutene liners." *Microelectronics Reliability* 53.5 (2013): 725-732.

Conference

- H. Jiang, **W. Yu**, et al. "Inkjet-printed Solid-state Potentiometric Nitrate Ion Selective Electrodes for Agricultural Application." *IEEE Sensors*, 2019
- H. Jiang, **W. Yu**, et al. "A biodegradable sensor housed in 3d printed porous tube for in-situ soil nitrate detection." *Solid-State Sensors, Actuators and Microsystems Workshop*, Hilton Head, 2018.
- H. Jiang, **W. Yu**, et al. "A pH-sensitive hydrogel-based smart switch for GI-tract payload release." *Micro Electro Mechanical Systems (MEMS), 2017 IEEE 30th International Conference*.
- **W. Yu**, et al. "Modular customizable 3d-printed batteries for wearable applications", *The 20th International Conference on Miniaturized Systems for Chemistry and Life Sciences(MicroTAS), 2016.*
- **W. Yu**, et al. "A diaper-embedded disposable nitrite sensor with integrated on-board urine-activated battery for UTI screening." *Engineering in Medicine and Biology Society (EMBC), 2016 IEEE 38th Annual International Conference*.
- W. Seo, **W. Yu**, et al. "Diaper-embedded urinary tract infection monitoring system powered by a urine-powered battery." *Biomedical Circuits and Systems Conference (BioCAS), 2015 IEEE*.
- R. Rahimi, M. Ochoa, **W. Yu**, et al. "A highly stretchable pH sensor array using elastomer-embedded laser carbonized patterns." *Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS), 2015 Transducers-2015 18th International Conference*.
- R. Rahimi, **W. Yu**, et al. "A low-cost fabrication technique for direct sewing stretchable interconnetions for wearable electronics." *Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS), 2015 Transducers-2015 18th International Conference.*
- R. Rahimi, M. Ochoa, **W. Yu**, et al. "A facile fabrication technique for stretchable interconnects and transducers via laser carbonization." *Micro Electro Mechanical Systems (MEMS), 2015 28th IEEE International Conference*.
- R. Rahimi, M. Ochoa, **W. Yu,** et al. "Flexible supercapacitor based on MnO2 coated laser carbonized electrodes." *Journal of Physics: Conference Series*. Vol. 660. No. 1. IOP Publishing, 2015.
- **W. Yu**, et al. "Optical nitrite sensor and urine-activated electrochemical power source on paper through laser-assisted patterning and lamination." *Proceedings of the MicroTAS, San Antonio* (2014).

Patents

- B. Jung, B. Ziaie, **W. Yu**, W. Seo, “DEVICES, SYSTEMS, AND METHODS FOR DETECTING TARGETED COMPOUNDS.” WIPO Patent Application WO2017160399A1. 21 Dec. 2017. Print.
- B. Ziaie, R. Rahimi, and **W. Yu**. "Smart capsule with GI-tract-location-specific payload release." U.S. Patent Application No. 14/919,120.