

Leilai Shao

Santa Barbara, California, 93106
UCSB Design and Test Lab [link](#)

Email: lshao@ucsb.edu
Mobile: (805) 708 6526

Education

University of California, Santa Barbara (UCSB)	Expected Graduation: 03.2020
Ph.D. Candidate in Computer Engineering	GPA: 3.97/4.0
University of California, Santa Barbara (UCSB)	09.2015 – 05.2018
M.S. in Computer Engineering	GPA: 3.96/4.0
Zhejiang University (Chu Kochen Honor College), Zhejiang, China	09.2011 – 06.2015
B.E., Electronics & Information Engineering	GPA: 3.91/4.0

Research & Development Experiences

Research at UCSB Design and Test Lab Advisor: Prof. K.-T. Tim Cheng 09.2015-Present

-Project 1: Device modeling for thin film transistors (TFT) and RF transmission line/antenna

- **Physics based modeling:** Developed the 1st SPICE compatible compact model of carbon nanotube (CNT) thin film transistors (TFT), which received *Best Paper Awards Nomination*, in Design, Automation and Test in Europe (DATE), 2018.
- **Data driven modeling:** Proposed an accurate S-parameter modeling method by correlating HFSS simulations and physical measurements for printed transmission line and antenna.

-Project 2: Flexible 2D sensor array and peripheral circuits design

- Designed, implemented and tested flexible scan drivers and amplifiers based on CNT TFT for sensor peripherals, which successfully pushed the boundary of state-of-art CNT TFT circuits by 10X in terms of performance and complexity (*Nature Nanotechnology*).
- Prototyped resistive ultra-thin 2D touch sensor array with integrated drivers and amplifiers.

Research Intern at HP Labs Advisor: Dr. Jim Huang & Dr. Ray Beausoleil 06.2018-09.2018

-Project: System modeling, simulation and verification for sensor acquisition system

- Developed the 1st system simulation and verification platform to enable co-simulation/physical verification of flexible electronics and CMOS ICs, which has been recognized as a standard by [NextFlex](#), an institute dedicated for the emerging flexible hybrid electronics.
- Implemented, simulated and verified the temperature sensor acquisition system in Cadence using customized Verilog-A models and physical verification scripts.

Research Intern at HP Labs Advisor: Dr. Jim Huang & Dr. Ray Beausoleil 06.2017-12.2017

-Project: Characterizing and testing of flexible circuits and sensors

- Designed automatic testing solution using customized PCB and Python GPIB interfaces.
- Characterized variations and defects of wafer level CNT TFTs and sensors using Python scripts and provided guidance on device optimizations to reduce parasitic contacts and capacitors.

Skills

System Simulation & Device Modeling	Cadence Virtuoso, Allegro/PSpice, MATLAB, ANSYS/HFSS, ADS, HSPICE, Verilog-AMS, SPICE script, Verilog/System Verilog.
Laboratory Instruments	Semiconductor analyzer, Network Analyzer, Oscilloscope, Signal Generators, LabVIEW.
Programming	Python, C/C++, MATLAB, Tensor flow/Pytorch and Convex optimization.

Publications

Shao, L., Huang, T. - C., Lei, T., Bao, Z., Beausoleil, R., and Cheng, K. - T., “*Compact Modeling of Carbon Nanotube Thin Film Transistors for Flexible Circuit Design*”, ***Best Paper Awards Nomination***, in Design, Automation and Test in Europe (DATE), Dresden, Germany, 2018.

Shao, L., Huang, T. - C., Lei, T., Chu, T.-Y., Bao, Z., Beausoleil, R., Wang, M. and Cheng, K. - T., “*Compact Modeling of Thin Film Transistors for Flexible Hybrid IoT Design*”, (Accepted), in IEEE Transaction of Design & Test, 2018.

Shao, L., Chu, T. - Y., Tao, Y., and Cheng, K. - T. Tim, “Fully Printed Organic Pseudo-CMOS Circuits for Sensing Applications”, in 1st IEEE International Flexible Electronics Technology Conference (IFETC), Ottawa, Canada, 2018.

Shao, L., Huang, T. - C., Lei, T., Bao, Z., Beausoleil, R., and Cheng, K. - T. Tim, “*Process Design Kit for Flexible Hybrid Electronics*”, (***Invited paper***) in in 23rd Asia and South Pacific Design Automation Conference (ASP-DAC), 2018.

Huang, T. - C., **Shao, L.**, Lei, T., Beausoleil, R. G., Bao, Z., and Cheng, K. - T. Tim, “*Robust Design and Design Automation for Flexible Hybrid Electronics*”, in International Symposium on Circuits and Systems (ISCAS), 2017.

Lei, T., **Shao, L. (Co-first)**, Zheng, Y., Pitner, G., Fang, G., Zhu, C., Li, S., Huang, Beausoleil, R., Wong, H. - S., Huang, T. - C., Cheng, K. - T., and Bao, Z. “*Large-scale, high-performance, flexible digital and analog circuits based on ultrahigh-purity and high-yield separation of semiconducting carbon nanotubes*”, (**Under review**), in Nature Nanotechnology.

Li, S., **Shao, L.**, Huang, T. - C., Beausoleil, R. “*Classifying Cardiac Abnormality from Noisy Heart Sounds with Reconfigurable Deep Neural Network Accelerators*”, (**Under review**), in IEEE Transactions on Biomedical Engineering.

Talks and Posters

- Qualify Presentation at UCSB: [Link](#)
- International Flexible Electronics Technology Conference (IFETC), Ottawa, Canada, 2018.: [Link](#)
- Design, Automation and Test in Europe (DATE), Dresden, Germany, 2018.: [Link](#)
- HKUST Guest Talk: [Link](#)

Awards & Honors

2018	Best Paper Awards Nomination in DATE 2018
2017	ChengMicro Fellowship, UCSB
2017	Graduate Student NRST Fellowship, UCSB
2015	Outstanding Thesis Award of the Department, Zhejiang University
2011-2014	Four-consecutive First-class Academic Scholarship (top 5%), Zhejiang University
2013-2014	Honorable Mentions in 2014 Interdisciplinary Contest in Modeling (ICM)
2011-2012	National Excellent Academic Scholarship (top 2%), Zhejiang University
