

Leilai Shao

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UCSB Design and Test Lab [link](#)

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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.S., Electronics & Information Engineering	GPA: 3.91/4.0

Research & Develop 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), Dresden, Germany, 2018.
- **Data driven modeling:** Proposed accurate S-parameter modeling method by exploring correlations between HFSS simulations and measurements for printed transmission line (TL) 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 (*Under review in Nature Nanotechnology*).
- Prototyped resistive ultra-thin (< 2um) 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 Cadence Virtuoso, Allegro/PSpice, MATLAB, ANSYS/HFSS, ADS, HSPICE,
& Device Modeling 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