RUICONG(RAY) CHEN

PhD Candidate of EECS@MIT | raychen@mit.edu | https://ruicong-chen.github.io/

RESEARCH INTERESTS

- **Mixed-signal Application-Specific Integrated Circuit (ASIC) Design**
- Hardware-security
- In-memory-computing
- Artificial intelligence

EDUCATION

- **Ph.D. Candidate**, Department of Electrical Engineering and Computer Science (**EECS**), MIT *2021-2023, Cambridge, MA*
  - Advisors: Anantha P. Chandrakasan and Hae-Seung Lee
- S.M., Department of Electrical Engineering and Computer Science (EECS), MIT *2019-2021, Cambridge, MA*
  - Thesis: Activity-Scaling SAR with Direct Hybrid Encodingfor Signed Expressions for AIoT Applications
  - Advisors: Anantha P. Chandrakasan and Hae-Seung Lee
- B.S., Department of Electrical Engineering and Computer Science (EECS), Peking University *2015-2019, Beijing, China*
  - Ranking the 1st in the department

SELECTED AWARDS

- Commlab Fellowship *by MIT School of Engineering*
- National Scholarship 2017 *by Ministry of Education of the P.R. China*
- Outstanding Graduate in Beijing 2019 *by Beijing Municipal Commission of Education*
- Outstanding Graduate of Peking University 2019 *by Peking University*
- 1st Prize, 33th National Physics Competition of Undergrad 2016 *by Beijing Municipal Commission of Education*

MAIN RESEARCH EXPERIENCE

- Circuit design for secure IoT applications *July 2021-present, MIT*
  - Design, simulate, fabricate and test ADC with side-channel attack resistance
  - Improve the circuit performance with security feature
  - **Work published on top venue of circuits, VLSI-C**
- Direct hybrid-encoding for signed expressions (HESE) SAR for neuromorphic computing *Apr 2020-June 2021, MIT*
  - Explore HESE to shorten signed-digit number representations for neuromorphic computing
  - Implement energy-efficient HESE-direct SAR ADC with spare cycles for calibrations
  - **Work published on ISLPED**
- Wireless and Batteryless Micro-Implants *Sept 2019-Mar 2020, MIT*
  - Design, simulate, fabricate, and test the system with costume designed IC on flexible PCB
  - **Work published on top venue of networking, MobiCOM**

FEATURED PUBLICATIONS

RaM-SAR: A Low Energy and Area Overhead, 11.3fJ/conv.-step 12b 25MS/s Secure Random-Mapping SAR ADC with Power and EM Side-channel Attack Resilience, The 2022 International Symposium on VLSI Circuits (**VLSI-C 2022**), accepted
R.-C Chen, H.-R Wang, A. Chandrakasan, H.-S Lee

A Bit-level Sparsity-aware SAR ADC with Direct Hybrid Encoding for Signed Expressions for AIoT Applications, The 2022 International Symposium on Low Power Electronics and Design (**ISLPED 2022**), accepted
R.-C Chen, H. T. Kung, A. Chandrakasan, H.-S Lee

Enabling Self-Reconfigurability for Wireless and Batteryless Micro-Implant, The 26th Annual International Conference on Mobile Computing and Networking (**MobiCOM 2020**)
M.-R, Abdelhamid, **R.-C Chen**, J.-Y Chou, A. Chandrakasan, F. Adib

SERVICE

- Circuit Session Chair of MTL Annual Research Conference (MARC) 2021
- Faculty Search Student Committee of MIT EECS department 2021-2023
- Commlab Fellow of MIT School of Engineering 2021-2023
- MIT Grad Dorm Leader 2020-2022

COURSES

Analysis and Design of Digital Integrated Circuits MIT 6.374
Hardware Architecture for Deep Learning MIT 6.825
Discrete-time Signal Processing MIT 6.341
CMOS Analog and Mixed-Signal Circuit Design MIT 6.775

TECHNICAL SKILLS

Programming SKills	C/C++, Python (Pytorch), TensorFlow, Keras, MATLAB, Java, HTML
Hardware Skills	Verilog, ISE design suit of FPGA, Cadence (Innovus and Virtuoso), HFSS, SPICE, Eagle, SolidWorks