

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 Encoding for 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 custom 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](#))

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