RUICONG(RAY) CHEN

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

EDUCATION

- Ph.D., Department of Electrical Engineering and Computer Science (EECS), **MIT** *2021-Present, Cambridge, MA*
  - Advisors: Anantha P. Chandrakasan and Hae-Seung Lee
  - Commlab Fellowship
- S.M., Department of EECS, **MIT** *2019-2021, Cambridge, MA*
  - Advisors: Anantha P. Chandrakasan and Hae-Seung Lee
- B.S., Department of EECS, **Peking University** *2015-2019, Beijing, China*
  - Ranking the 1st in the department
  - National Scholarship (1%)

RESEARCH INTERESTS

- **Mixed-signal Application-Specific Integrated Circuit (ASIC) Design**
- Hardware security
- In-memory computing and machine learning

MAIN RESEARCH EXPERIENCE

- Circuit design for secure IoT applications *July 2021-Present, MIT*
  - Design, simulate, fabricate and test ADCs with side-channel attack resistance
  - Improve the circuit performance by 12.5 times with random switching
  - **Two publications on top venue of circuits, VLSI-C and CICC**
- Direct hybrid-encoding for signed expressions (HESE) SAR for neuromorphic computing *Apr 2020-June 2021, MIT*
  - Implemented energy-efficient HESE-direct SAR ADC
  - Increased the sparsity by 50% with direct sparsity encoding
  - **Work published on ISLPED**
- Wireless and Batteryless Micro-Implants *Sept 2019-Mar 2020, MIT*
  - Designed, simulated, fabricated, and tested the system with costume designed IC on flexible PCB
  - **Work published on top venue of networking, MobiCOM**

FEATURED PUBLICATIONS

Sniff-SAR: A 9.8fJ/c.-s 12b secure ADC with detection-driven protection against power and EM side-channel attack, The 2023 Custom Integrated Circuits Conference (**CICC 2023**)
R.-C Chen, A. Chandrakasan, H.-S Lee

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**)
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

SELECTED AWARDS

- 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*

SERVICE

- Reviewers of ISCAS, TVLSI, T-CAS I and T-CAS II Current

TECHNICAL SKILLS

Programming SKills Python (Pytorch), MATLAB, C/C++
Hardware Skills Verilog, Cadence (Virtuoso, Innovus and Genus), HFSS, SPICE, Eagle, SolidWorks