

DICHENG MO

[LinkedIn](#) | [Google Scholar](#) | Tel: (352) 328-8369 | dicheng.mo@ufl.edu

EDUCATION

University of Florida Gainesville, FL, USA

Ph.D. in Electrical and Computer Engineering (Estimated) 12/2023

- Dissertation: Intrinsic Configurable Scandium Aluminum Nitride Resonator and Filter
- Advisor: Dr. Roozbeh Tabrizian
- Committee: Dr. Yong-Kyu Yoon, Dr. Toshikazu Nishida, and Dr. Brent Gila.

University of Florida Gainesville, FL, USA

MS in Electrical and Computer Engineering 05/2020

- GPA: 3.89/4.0
- Finished Microelectronic Fabrication Technology (A-), Principle of Micro-Electro-Mechanical Transducers (A) and Resonant MEMS(A-), Radio-Frequency Electronics(A), Electromagnetic fields application(A-), VLSI Circuit & Technology(A)

Harbin Institute of Technology Harbin, CHN

BE in Electronics Information Science and Technology 07/2018

- GPA: 3.2/4.0

TECHNICAL SKILLS

- Software: COMSOL, Keysight Advanced Design System, Ansys HFSS, Cadence Design system, AutoCAD, L-Edit.
- Hardware: Keysight N5222A PNA vector network analyzer, Keysight N5173B signal generators, Keysight N9010A signal analyzer, Radiant PiezoMEMS ferroelectric tester, Semi-Probe PSL4 RF probe station, Zurich Instruments UHFLI 600MHz lock-in amplifier, Rohde&Schwarz Signal and spectrum analyzer.
- Languages: Native Speaker of Chinese, fluent in English.

RESEARCH EXPERIENCE

Fe-based Carbon Catalyst for Fuel Cell Application 10/2017-07/2018

- Synthesized phenol resin, with polymerization and carbonization at different temperatures.
- Loading various Fe-based catalytically active materials onto the carbon powder.

PZT Wireless Excited MEMS Tag 09/2019-12/2019

- Literature review on RFID system, multi-Mode MEMS resonate tags and various antennae.
- COMSOL simulation on tag models for authentication applications.

ScAlN Complex Dielectric Constant Characterization 02/2020-07/2021

- Coplanar waveguide (Metal-insulator-metal capacitor) structure development and ADS simulation.
- Experimental characterization of the complex dielectric constant of 50nm/200nm ScAlN with 22%/28% Sc-atomic content and 3nm/30nm seed layers, funded by the DARPA TUFEN project.

RF MEMS Lamb-Wave Resonator and Filter Based on Ferroelectric ScAlN 07/2020-08/2022

- Theory development and COMSOL modeling based on the ferroelectricity-based piezoelectric property change in $\text{Sc}_{0.22}\text{Al}_{0.78}\text{N}$ Lamb-wave resonator.
- Phototype layout design, ferroelectric characterization, and RF characterization of the Lamb-wave resonator observing a 15.5dB on/off isolation in resonator transmission peak upon intrinsic switching off. ([EDL 2021](#) and [Transducer 2021](#))
- Proposed the dual-mode complementary switching through the ferroelectric polarization configuration in ScAlN Lamb-Wave resonator. ([MDPI 2022](#))

- Phototype design on complementary-switchable $\text{Sc}_{0.28}\text{Al}_{0.72}\text{N}$ dual-mode filter. ([PSS RRL 2022](#))

RF MEMS Thickness-Extensional Resonator Based on Ferroelectric ScAlN 01/2021-now

- Theory development and COMSOL modeling of TE_1/TE_2 dual-mode $\text{Sc}_{0.28}\text{Al}_{0.72}\text{N}$ bi-layer resonator.
- Phototype layout design, ferroelectric characterization, and RF characterization of the TE resonator, with resonator TE_1/TE_2 mode operation controlled by the ferroelectric polarization in one of the ScAlN films. ([TED 2022](#))

RF MEMS Pre-Switched Lamb-Wave Resonator Based on Ferroelectric ScAlN 06/2022-now

- Theory development and COMSOL modeling of Lamb-wave resonators with reduced device line impedance, merit from the ferroelectric polarization pre-definition in ScAlN.
- Layout and process flow development of the pre-switch Lamb-wave resonator with operation frequency up to 15GHz.
- Currently drafting thesis targeting Applied Physics Letter.

PH.D. JOURNAL PUBLICATIONS

- [D. Mo, S. Rassay, and R. Tabrizian, "Intrinsically Switchable Dual-Band Scandium-Aluminum Nitride Lamb-Wave Filter," *physica status solidi \(RRL\)–Rapid Research Letters*, p. 2200135, Aug. 2022, doi: 10.1002/pssr.202200135.](#)
- [D. Mo, S. Dabas, S. Rassay, and R. Tabrizian, "Complementary-Switchable Dual-Mode SHF Scandium Aluminum Nitride BAW Resonator," in *IEEE Transactions on Electron Devices*, vol. 69, no. 8, pp. 4624-4631, Aug. 2022, doi: 10.1109/TED.2022.3183963.](#)
- [S. Rassay, D. Mo, and R. Tabrizian, "Dual-Mode Scandium-Aluminum Nitride Lamb-Wave Resonators Using Reconfigurable Periodic Poling," *Micromachines*, vol. 13, no.7, p. 1003, Jun. 2022, doi: 10.3390/mi13071003.](#)
- [S. Rassay, D. Mo, C. Li, N. Choudhary, C. Forgey, and R. Tabrizian, "Intrinsically Switchable Ferroelectric Scandium Aluminum Nitride Lamb-Mode Resonators," in *IEEE Electron Device Letters*, vol. 42, no. 7, pp. 1065-1068, July 2021, doi: 10.1109/LED.2021.3078444.](#)

PH.D. PEER-REVIEWED CONFERENCE PUBLICATIONS

- [S. Dabas, D. Mo, S. Rassay and R. Tabrizian, "Intrinsically Tunable Laminated Ferroelectric Scandium Aluminum Nitride Extensional Resonator Based on Local Polarization Switching," *2022 IEEE 35th International Conference on Micro Electro Mechanical Systems Conference \(MEMS\)*, 2022, pp. 1050-1053, doi: 10.1109/MEMS51670.2022.9699790.](#)
- [D. Mo, S. Rassay and R. Tabrizian, "Intrinsically Switchable Ferroelectric Scandium Aluminum Nitride Bulk Acoustic Wave Resonators," *2021 21st International Conference on Solid-State Sensors, Actuators and Microsystems \(Transducers\)*, 2021, pp. 317-320, doi: 10.1109/Transducers50396.2021.9495634.](#)

RECENT AWARD

- Finalist in the Student Best Paper competition in [EFTF-IFCS 2022](#), titled "A 7 GHz – 13.4 GHz Complementary-Switchable Thickness-Extensional Bulk Acoustic Resonator Using Laminated Ferroelectric $\text{Sc}_{0.28}\text{Al}_{0.72}\text{N}$ ".

CO-CURRICULAR ACTIVITY

- Member of the Interdisciplinary Microsystems Group Tech Committee (2020 spring – 2022 fall).
- Chair of the Interdisciplinary Microsystems Group Tech Committee (2023 spring – 2023 fall).