Ian Huang

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PROFESSIONAL SUMMARY

Ph.D. candidate in Communication Engineering with 8+ years of hands-on experience in cryogenic RF measurement systems, sub-THz characterization, antenna and RF front-end development, and CMOS/GaAs IC tapeout. Built 67 GHz RF test setups, developed cryogenic calibration methods, and supported hardware integration for RF and quantum-related applications.

EDUCATION

National Taiwan University Taipei, Taiwan
Ph.D. Candidate, Communication Engineering *Sep 2019 – Present*
Direct transition from M.S. program (entered Feb 2018); M.S. degree not separately conferred

- Advisor: Dr. Shih-Yuan Chen
- Research Topic: Integration and Characterization of Control and Readout RF Circuitries for Quantum and Cryogenic Applications
- Award: 2020 iWEM Conference Best Paper Award
- Teaching Assistant: Antenna Course (*Fall 2025*)

University of Michigan – Ann Arbor Ann Arbor, Michigan, USA
Bachelor of Science in Mechanical Engineering *2012 – 2016*

- University of Michigan Dean's List, University of Michigan Honors (*Winter 2015*)

SELECT RF SYSTEM PROJECTS

Cryogenic Measurements NTU GICE
System Setup *2022 – 2026*

- Designed an 18 GHz cryogenic RF signal chain and fabricated Rogers RO3003 PCB sample holders for dilution refrigerator measurements from 10 mK – 300 K, accounting for high-frequency routing and stable D_k.
- Developed mK cryogenic TRL calibration procedures for RF measurements in a dilution refrigerator, including the effects of cable loss, temperature dependence, and limited in-situ standards.
- Configured a DC – 67 GHz, 4-K probe station and selected instrumentation and components for low-temperature IC and device characterization.

sub-THz System NTU GICE
Design and Measurement *2025, 2020*

- Designed the RF system for a 150 GHz transmittive microwave imaging system to measure a 61×61 grid.
- Measured S-parameters of a 170 GHz patch antenna using a D-band state-of-the-art probe antenna system.

IC Design NTU GICE
Design and Tapeout *2020*

- Taped out a 28-bit Serial-Peripheral Interface IC for bias voltage control using 0.18 μm CMOS.
- Taped out a 29 GHz 1 W GaAs PA using 0.15 μm pHEMT Technology for SATCOM applications.
- Taped out a 29 GHz IQ Up-Converter using 0.18 μm CMOS Technology.

Ka-band SATCOM Project with KACST NTU GICE
TRx System Integration *2018*

- Characterized individual Tx/Rx RFIC building blocks, including up/down-conversion, phase shifting, buffering, PA/LNA stages, and antenna-array interfaces.
- Coordinated subsystem integration across multiple labs to assemble and validate the end-to-end TRx chain.
- Performed module- and system-level testing to verify combined transmitter/receiver operation.

Falcon Tracking Project NTU GICE
Long Range Transceiver Design and Fabrication *2018*

- Designed transmitter and receiver systems for long-range GPS wireless transmission.
- Created an Android app written in React Native to display GPS data and compass direction.
- Designed and fabricated cases for modules and housing using Solidworks.

WORK EXPERIENCE

Extol Holland, Michigan, USA

Design Engineer *09/2016 – 08/2017*

- Led the mechanical design of integration packages for infrared plastic staking machines, utilizing SolidWorks for component modeling and assembly.

Exosite Taichung, Taiwan

Testing Intern *05/2014 – 08/2014*

- Developed JavaScript/Selenium browser-automation scripts to test, debug, and validate customer web portals.

National Taiwan University Taipei, Taiwan

Research Assistant *05/2013 – 08/2013*

- Experimented with the heat transfer and dissipation of satellite IC chips at different power outputs.
- Analyzed the optimization of heat dissipation required to satisfy specifications.

SKILLS & ABILITIES

SOFTWARE - (EM Simulations): Ansys HFSS, ADS, Sonnet, COMSOL, Cadence
- (CAD): SolidWorks, Autodesk Inventor, MSC Adams, Altium
- (Coding): Python, React Native, MATLAB, LabVIEW, C++, JavaScript

MACHINING - Mill, Lathe, Drill Press, Bandsaw, Waterjet Cutter

PUBLICATIONS

Journals

- H.-P. Liao, **I. Huang**, and S.-Y. Chen, "An ultra-lightweight wideband folded E-shaped patch antenna made from aluminum meshes for high-power S-band applications," *IEEE Transactions on Antennas and Propagation*, 2025.
- Y.-C. Chang, **I. Huang**, C.-Y. Chen, M.-J. Lin, S.-Y. Chen, and J.-Y. Li, "Electron-spin-resonance meanderlines for effective spin control in Si quantum dots for large-scale qubit applications," *Applied Physics Letters*, vol. 119, no. 24, Art. no. 243503, 2021.
- J. Y.-C. Liu, **I. Huang**, Y.-H. Kuo, W.-T. Li, W.-H. Lin, W.-J. Lin, J.-H. Tsai, H. Alsuraisry, H.-C. Lu, and T.-W. Huang, "Smart RF integrated circuits: A millimeter-wave gigabit transceiver with digitally-enabled built-in self-healing and auto-switching functions," *IEEE Microwave Magazine*, vol. 20, no. 1, pp. 28–37, 2018.

Conferences

- S.-W. Wu, **I. Huang**, R. Jeanty, Z.-H. Fu, K.-Y. Lin, and S.-Y. Chen, "A miniaturized microstrip-based phase inverter as a phase delay component at 24 GHz," in *Proc. 2024 Int. Symp. on Antennas and Propagation (ISAP)*, pp. 1–2, 2024.
- S.-Y. Chen, **I. Huang**, M.-J. Lin, J.-Y. Li, and S.-Y. Chen, "A DC to 67-GHz 40-nm CMOS SP4T switch for cryogenic S-parameter measurement and calibration," in *Proc. 2024 19th European Microwave Integrated Circuits Conf. (EuMIC)*, pp. 206–209, 2024.
- Y.-T. Chen, **I. Huang**, M.-J. Lin, S.-Y. Chuang, H.-L. Ho, K.-S. Hsu, P.-Y. Lin, S.-Y. Chen, L.-H. Lu, and S.-Y. Chen, "A thru-reflect-series-resistance (TRS) calibration for cryogenic device characterization in 40-nm CMOS technology," in *Proc. 2023 IEEE/MTT-S Int. Microwave Symp. (IMS)*, pp. 1203–1206, 2023.
- **I. Huang**, L.-Y. Kung, and S.-Y. Chen, "Multi-layered proximity probe-fed E-shaped patch antenna array for terahertz imaging system," in *Proc. 2023 17th European Conf. on Antennas and Propagation (EuCAP)*, pp. 1–5, 2023.
- **I. Huang**, C.-L. Liao, and S.-Y. Chen, "Dual-linearly-polarized printed dual-dipole antenna array for polarimetric radar application," in *Proc. 2020 Int. Workshop on Electromagnetics: Applications and Student Innovation Competition (iWEM)*, pp. 1–2, 2020.
- H. Alsuraisry, W.-J. Lin, **I. Huang**, and T.-W. Huang, "Design of Ka-band transceiver for satellite communication," in *Proc. 2019 IEEE Jordan Int. Joint Conf. Electr. Eng. Inf. Technol. (JEEIT)*, pp. 307–310, 2019.
- K.-C. Chiang, T.-C. Tsai, **I. Huang**, J.-H. Tsai, and T.-W. Huang, "A 27-GHz transformer based power amplifier with 513.8-mW/mm^2 output power density and 40.7% peak PAE in 1-V 28-nm CMOS," in *Proc. 2019 IEEE MTT-S Int. Microwave Symp. (IMS)*, pp. 1283–1286, 2019.
- **I. Huang**, Y.-C. Li, W.-C. Lin, J.-H. Tsai, A. Alshehri, M. Almalki, A. Sayed, H.-C. Lu, and T.-W. Huang, "Reviews of high image rejection up and down converters for next-generation satellite applications," in *Proc. 2018 IEEE Int. Symp. Radio-Frequency Integration Technol. (RFIT)*, pp. 1–3, 2018.
- T.-C. Tsai, **I. Huang**, J.-H. Tsai, A. Alshehri, M. Almalki, A. Sayed, and T.-W. Huang, "A Ka-band sub-harmonically pumped mixer using diode-connected MOSFET for 5G mm-wave transceivers," in *Proc. 2018 Asia-Pacific Microwave Conf. (APMC)*, pp. 488–490, 2018.
- **I. Huang**, S.-T. Yen, W.-P. Chao, J.-H. Tsai, A. Alshehri, M. Almalki, A. Sayed, and T.-W. Huang, "A 29.6 dBm 29-GHz power amplifier for satellite and 5G communications using 0.15-μm GaAs p-HEMT technology," in *Proc. 2018 Asia-Pacific Microwave Conf. (APMC)*, pp. 986–988, 2018.

Patents

- J.-Y. Li, S.-Y. Chen, Y.-C. Chang, **I. Huang**, and C.-Y. Chen, "Electronic device with conductive resonator," U.S. Patent App. 18/443,839, Jun. 6, 2024.