# Hsinju CHEN

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## EDUCATION

**University of Illinois at Urbana–Champaign** (UIUC) — Urbana, IL, USA

Ph.D. student, Electrical and Computer Engineering [current GPA 3.86/4.0] — Aug 2020 – present
Advisor: Raluca Ilie, Ph.D.

Study Abroad Program, Grainger College of Engineering [GPA 3.89/4.0] — Aug 2018 – May 2019

**National Taiwan University** (NTU) — Taipei, Taiwan

M.S., Communication Engineering (Electromagnetics Group) [GPA 4.09/4.3] — Sept 2017 – Jun 2020
Advisor: Shih-Yuan Chen, Ph.D.
Thesis: "Polarization-Agile Stub-Loaded Square Patch Antenna Array with Sequential Rotation Feed"

B.S., Electrical Engineering [GPA 3.31/4.3] — Sept 2013 – Jun 2017

## RESEARCH EXPERIENCE

**Heliophysics Research and Applications (HeRA) | Professor Raluca Ilie** — Urbana, IL, USA
*Department of Electrical & Computer Engineering, University of Illinois at Urbana–Champaign* — Aug 2020 – present

- study the transport of energetic heavy ions ($N^+$ & $O^+$) in the Earth's magnetosphere with multi-fluid magnetohydrodynamics model BATS-R-US in SWMF

**Advanced Antenna Laboratory (AAL) | Professor Shih-Yuan Chen** — Taipei, Taiwan
*Graduate Institute of Communication Engineering, National Taiwan University* — Mar 2016 – Jul 2020

- Polarization-Agile Patch Antenna Array: proposed a polarization-agile patch antenna array with sequential rotation feed consisting of triple-stub loaded-line phase shifters and reconfigurable antenna elements
- Antenna with Switchable Polarization at 28 GHz on Integrated Circuit Packaging: proposed a novel polarization-agile patch antenna structure on IC packaging for 5G communications
- Brewster Angle and Vanishing Polarization of Incident Wave on PEC-Backed Dielectric Slab: conducted experiment to realize near-total transmission of parallel polarized incident wave on copper-backed water slab

**Electromagnetics Laboratory | Professor Jennifer T. Bernhard** — Urbana, IL, USA
*Department of Electrical & Computer Engineering, University of Illinois at Urbana–Champaign* — Oct 2018 – May 2019

- Coupling Effects on Polarization-Agile Patch Antenna Arrays: studied coupling effects of proposed polarization-agile patch antenna arrays with different element arrangements
- Polarization-Agile Patch Antenna Array with Coupled Sequential Feed: proposed polarization-agile patch antenna array with inherent DC blocks and implemented sequential feed method

**Speech Processing Laboratory | Professor Lin-Shan Lee** — Taipei, Taiwan
*Department of Electrical Engineering, National Taiwan University* — Aug 2016 – Jan 2017

- Natural Language Understanding: built a speech recognition system using Kaldi toolkit; researched on how computer systems understand human languages with various training methods
- Sentence Generator: developed a sentence generating system capable of dealing with any language when given enough input data for frequency detecting and calculation

## TEACHING EXPERIENCE

**University of Illinois at Urbana–Champaign** — Urbana, IL, USA

Teaching Assistant: ECE 398 Fields & Waves Virtual Reality Lab — Jan 2021 – Dec 2022

- teach multiple lab sessions with a total of 40 students
- hold Mathematica tutorial office hours & evaluate quizzes and Mathematica notebook homework performances
- test virtual reality applications and provide Oculus technical support during lab sessions

**National Taiwan University** — Taipei, Taiwan

Teaching Assistant: EE 5010 Antenna — Mar 2020 – Jun 2020

- assessed midterm exam and held weekly office hours for a 40-student class
- built a whack-a-mole game for phased array final project in a team of 4 TAs

Teaching Assistant: EE 2003 Engineering Mathematics–Complex Variables — Sept 2019 – Jan 2020

- assessed and developed solutions to homework & quizzes, and held weekly office hours for a 60-student class
- managed course website and oversaw a team of 3 TAs

**Taiwan Fund for Children and Families** — New Taipei, Taiwan

Volunteer Tutor — Sept 2014 – Jun 2015

- taught all subjects to one middle & one high school students

## MENTORING EXPERIENCE

Mayura Kulkarni (UIUC ECE undergraduate) Jun 2021 – Aug 2022

· co-mentored with Mei-Yun Lin on OGO 6 data visualization project

## OTHER WORK EXPERIENCE

Lab Coordinator | **University of Illinois at Urbana–Champaign**, Urbana, IL, USA Aug 2021 – present

· manage a team of around 20 student developers

Freelance Technical Translator | **Linguitronics**, Taipei, Taiwan Feb 2017 – Mar 2020

· translated technical documents from Traditional/Simplified Chinese to English

RF IC Design Intern | **MediaTek**, Hsinchu, Taiwan Jul 2017 – Aug 2017

· automated Synopsys Custom WaveView for EMI/EMC simulations with Tcl and Perl

Research Assistant | **University of Hong Kong**, Hong Kong Nov 2014 – Mar 2015

· transcribed interviews and assisted with finding research materials for Dr. Cheris Chan Shun Ching during her visit in Taiwan

Administrative TA | **National Taiwan University**, Taipei, Taiwan May 2014

· ensured safety of 70+ students at electrical engineering pre-freshman camp

## RESEARCH GRANTS

**NASA FINESST (Future Investigators in NASA Earth and Space Science and Technology)** Jan 2023 – Dec 2025

"Past the Point of No Return: The Journey of Heavy Ions throughout the Earth's Magnetosphere" (21-HELIO21-0054)

· FI, NASA Science Mission Directorate (SMD), $150k

**Grassroots Initiatives to Address Needs Together (GIANT)** Apr 2022 – Dec 2023

"HUG Initiative: Research Career Roadmap for Historically Marginalized or Underrepresented Genders"

· Co-PI, Institute for Inclusion, Diversity, Equity & Access (IDEA) Institute, Grainger College of Engineering & IBM–Illinois Discovery Accelerator Institute (IIDA), $12k

## HONORS & AWARDS

Michael H. Freilich Student Visualization Competition Runner-Up Winner, AGU 2022

2022 Boulder Space Weather Summer School Travel Grant, UCAR 2022

2022 GEM Summer Workshop Student Travel Grant, NSF 2022

Graduate Student Thesis Contest 3rd Prize, Chinese Institute of Electrical Engineering 2020

Student Paper Contest Honorable Mention, IEEE AP–S 2018

Taiwan Creative Electromagnetic Implementation Competition 3rd Prize 2016

## PROFESSIONAL SERVICE

Student Representative | **Geospace Environment Modeling (GEM)**, USA 2022 – 2024

Steering Committee Voting Member | **Geospace Environment Modeling (GEM)**, USA 2022 – 2024

DEI Subcommittee Member | **Geospace Environment Modeling (GEM)**, USA 2022 – 2024

Student Moderator | **Geospace Environment Modeling (GEM) Workshop**, Virtual Meeting Jul 2021

## COMMUNITY SERVICE

Student Volunteer | **Office of International Affairs**, College of EECS, NTU, Taipei, Taiwan Jul 2019 – Jan 2020

Information Center Volunteer | **Taiwan LGBT Pride**, Taipei, Taiwan Sept 2019 – Oct 2019

Volunteer Parade Route Marshal | **LA Pride**, West Hollywood, CA, USA May 2019 – Jun 2019

Volunteer Student Usher | **Krannert Center for Performing Arts**, Urbana, IL, USA Sept 2018 – May 2019

Volunteer Exchange Student | **IPENG, College of Engineering, UIUC**, Urbana, IL, USA Sept 2018 – May 2019

Medical & Foreign Language Volunteer | **2017 Taipei Universiade**, Taipei, Taiwan Jul 2015 – Aug 2017

Volunteer Tutor | **Taiwan Fund for Children and Families**, New Taipei, Taiwan Sept 2014 – Jun 2015

## EXTRACURRICULAR & LEADERSHIP ACTIVITIES

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| UIUC Busey–Evans Book Club ['19 Vice President] | Sept 2018 – May 2019 |
| UIUC Women on a Mission at Busey–Evans Hall ['18–'19 Historian] | Aug 2018 – May 2019 |
| Project Leadership at UIUC University Housing | Apr 2019 |
| NTU Women's Varsity Softball ['16–'17 Vice Captain & '15–'16 Treasurer] | Jan 2015 – Feb 2018 |
| NTUEE Women's Volleyball Team ['15–'16 Team Captain] | Sept 2013 – Dec 2016 |

## INVITED TALK

1. Chen, H. (2022, June 19). *What's in the Dark: Magnetotail & Plasma Sheet*. Geospace Environment Modeling 2022 Summer Workshop Student Day Tutorial, Honolulu, HI.

## CONFERENCE PAPERS (PEER-REVIEWED)

1. Ilie, R., Shaffer, E., D'Angelo, C. M., Cermak, D., Lin, M.-Y., & H. Chen (2021). Virtual reality laboratory experiences for electricity and magnetism courses. *2021 ASEE Virtual Annual Conference Content Access*. https://strategy.asee.org/38025
2. Chen, H., & Chen, S.-Y. (2020). Polarization-reconfigurable patch antenna-on-package for millimeter-wave operations with dc bias circuit design. *2020 14th European Conference on Antennas and Propagation (EuCAP)*. https://doi.org/10.23919/eucap48036.2020.9135761
3. Chen, H., & Chen, S.-Y. (2020). Brewster angle and vanishing polarization of wave reflected by conductor-backed water slab. *2020 14th European Conference on Antennas and Propagation (EuCAP)*. https://doi.org/10.23919/eucap48036.2020.9135947
4. Chen, H., Chen, S.-Y., & Bernhard, J. T. (2019). Coupling effects on polarization-agile patch antenna arrays. *2019 IEEE Antennas and Propagation Society International Symposium and USNC-URSI Radio Science Meeting*, 1771–1772. https://doi.org/10.1109/APUSNCURSINRSM.2019.8888660
5. Chen, H., & Chen, S.-Y. (2018). A polarization-agile stub-loaded square patch antenna with proximity coupled feed. *2018 IEEE Antennas and Propagation Society International Symposium and USNC-URSI Radio Science Meeting*, 859–860. https://doi.org/10.1109/APUSNCURSINRSM.2018.8609448

## CONFERENCE ABSTRACTS (PEER-REVIEWED)

1. Chen, H., & Ilie, R. (2022, December 12–16). *See you on the other side: The impact of N+/O+ composition on heavy ion transport and magnetosphere dynamics in multifluid modeling* [Conference presentation abstract]. AGU Fall Meeting 2022, Chicago, IL.
2. Chen, H., Lin., M.-Y., Kulkarni, M., Huang, A., Golecki, H., Cusick, R. D. (2022, December 12–16). *HUG Initiative: Promoting research careers for ciswomen, transgender and nonbinary people*. AGU Fall Meeting 2022, Chicago, IL.
3. Ilie, R., Kuo, J., & Chen, H.. (2022, December 12–16). *Building diverse and inclusive teams: Lessons learned from the development of Virtual Reality learning experiences for STEM fields* [Conference presentation abstract]. AGU Fall Meeting 2022, Chicago, IL.
4. Lin., M.-Y., Vandegriff, E., Chen, H., & Mukhopadhyay, A. (2022, December 12–16). *Integrating student involvement to the GEM Workshop and its implications to the advancement of DEI* [Conference presentation abstract]. AGU Fall Meeting 2022, Chicago, IL.
5. Ilie, R., Liu, J., Chen, H. (2022, July 16–24). *Mass coupling across magnetosphere-ionosphere system* [Conference presentation abstract]. COSPAR 2022 44th Scientific Assembly, Athens, Greece.
6. Ilie, R., Chen, H., Zhang, C., & Lin, M.-Y. (2021, December 13–17). *Tracking the behavior of $N^+$ and $O^+$ throughout the terrestrial magnetosphere* [Conference presentation abstract]. 2021 AGU Fall Meeting, New Orleans, LA.
7. Kulkarni, M., Ilie, R., Lin, M.-Y., & Chen, H. (2021, December 13–17). *Variations in ionospheric heavy ion (N+, O+, N2+, NO+, O2+) densities with geomagnetic activity* [Conference presentation abstract]. 2021 AGU Fall Meeting, New Orleans, LA.
8. Ilie, R., Chen, H., Kuo, J., Cermak, D., & Shaffer, E. (2021, December 13–17). *Using VR technology to teach electricity and magnetism* [Conference presentation abstract]. 2021 AGU Fall Meeting, New Orleans, LA.

## POSTER PRESENTATIONS

1. Chen, H., & Ilie, R. (2022, June 19–24). *The Role of N+ in the Magnetosphere Dynamics: A Multifluid MHD Study* [Poster presentation]. Geospace Environment Modeling 2022 Summer Workshop, Honolulu, HI.
2. Ilie, R., Ball, C., Cermak, D., Fisher, J., Kudeki, E., Shaffer, E., Kuo, J., & Chen, H. (2022, June 19–24). *Learning Electrodynamics in Virtual Reality* [Poster presentation]. Geospace Environment Modeling 2022 Summer Workshop, Honolulu, HI.
3. Ilie, R., Ball, C., Cermak, D., Fisher, J., Kudeki, E., Shaffer, E., Chen, H., & Kuo, J. (2022, April 15). *Using Virtual Reality for Electricity and Magnetism Education* [Poster presentation]. 2022 AE3 Celebration of Teaching, Urbana, IL.
4. Chen, H., & Ilie, R. (2021, July 25–30). *N+: Journey to the Dark Side* [Poster presentation]. Geospace Environment Modeling 2021 Virtual Summer Workshop, Virtual Meeting.

## POSTER

1. Kulkarni, M., Ilie, R., Lin, M.-Y., & Chen, H. (2022, June 19–24). *Variations in Heavy Ion Composition with Geomagnetic Activity and Season*. Geospace Environment Modeling 2022 Summer Workshop, Honolulu, HI.
2. Kulkarni, M., Ilie, R., Lin, M.-L., & Chen, H. (2021, Sept. 30). *Variations in Ionospheric Heavy Ions (H+, He+, N+, O+, N2+, NO+, O2+) Densities with Geomagnetic Activity*. Fall 2021 Engineering Research Fair, Urbana, IL.

## SKILLS

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| Technical Skills | Technical Software: SWMF, Tecplot 360 (incl. Tecplot macro), ANSYS HFSS, Adobe Illustrator<br>Computer Languages: Python, MATLAB, Fortran 90, C++, LabVIEW, Perl, Tcl<br>Markdown Languages: LaTeX<br>Operating Systems: macOS, Microsoft Windows, Ubuntu Linux |
| Languages | English (bilingual), Mandarin / Traditional Chinese (native), Taiwanese / Hokkien (intermediate) |