HUANTING HUANG

Jet Propulsion Laboratory, 4800 Oak Grove Drive • Huanting.Huang@jpl.nasa.gov

EDUCATION

PhD in Electric Engineering / Applied Electromagnetics and RF Circuit Dec 2019
University of Michigan, Ann Arbor, MI Jan 2015 – 2019
University of Washington, Seattle, WA Sep 2012 – Dec 2014

Bachelor of Engineering in Electronic and Communication Engineering May 2012
City University of Hong Kong, Hong Kong Sep 2008 – May 2012, except Jan 2011 – May 2011
Vanderbilt University, Nashville, TN (Exchange Student) Jan 2011 – May 2011

WORK EXPERIENCE

Research Technologist, Water and Ecosystems Group
NASA Jet Propulsion Laboratory, California Institute of Technology Oct 2023 – Present

EMC (Electromagnetic Compatibility) Design Engineer
BorgWarner, Kokomo, IN Oct 2019 – Sep 2023

Fellowship & Graduate Student Research Assistantship
University of Michigan, Ann Arbor, MI Jan 2015 – Sep 2019

Graduate Student Research or Teaching Assistantship
University of Washington, Seattle, WA Sep 2012 – Dec 2014

JOURNAL PUBLICATIONS

[1] **H. Huang**, L. Tsang, A. Colliander, R. Shah, X. Xu and S. Yueh, "Multiple Scattering of Waves by Complex Objects Using Hybrid Method of T-Matrix and Foldy-Lax Equations Using Vector Spherical Waves and Vector Spheroidal Waves", *Progress In Electromagnetics Research*, vol. 168, pp.87-111, 2020.

[2] **H. Huang**, L. Tsang, A. Colliander, and S. Yueh. "Propagation of Waves in Randomly Distributed Cylinders Using Three-Dimensional Vector Cylindrical Wave Expansions in Foldy–Lax Equations", *IEEE Journal on Multiscale and Multiphysics Computational Techniques*, vol. 4, pp. 214-226, 2019.

[3] L. Zhu, J. Walker, L. Tsang, **H. Huang**, N. Ye, and C. Rüdiger. "A Multi-Frequency Framework for Soil Moisture Retrieval from Time Series Radar Data", *Remote Sensing of Environment*, vol. 235, pp. 111433, 2019.

[4] L. Zhu , J. P. Walker, L. Tsang, **H. Huang**, N. Ye, and C. Rüdiger. "Soil Moisture Retrieval from Time Series Multi-Angular Radar Data Using a Dry Down Constraint", *Remote Sensing of Environment,* vol. 231, 2019.

[5] S.B. Kim, **H. Huang**, T.H. Liao and A. Colliander, "Estimating Vegetation Water Content and Soil Surface Roughness Using Physical Models of L-Band Radar Scattering for Soil Moisture Retrieval", *Remote Sensing*, vol. 10, no. 4, pp. 556, 2018.

[6] **H. Huang**, L. Tsang, E. G. Njoku, A. Colliander, T.-H. Liao and K. H. Ding, "Propagation and Scattering by a Layer of Randomly Distributed Dielectric Cylinders Using Monte Carlo Simulations of 3D Maxwell Equations with Applications in Microwave Interactions with Vegetation", *IEEE Access*, vol. 5, pp. 11985-12003, 2017.

[7] L. Tsang, T.-H. Liao, S. Tan, **H. Huang**, T. Qiao, K. H. Ding, "Rough Surface and Volume Scattering of Soil Surfaces, Ocean Surfaces, Snow, and Vegetation Based on Numerical Maxwell Model of 3-D Simulations", in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. PP, no. 99, pp. 1-18, 2017.

[8] **H. Huang**, T.-H. Liao, L. Tsang, E. G. Njoku, A. Colliander, T. J. Jackson, M. S. Burgin, and S. Yueh, "Modelling and Validation of Combined Active and Passive Microwave Remote Sensing of Agricultural Vegetation at L-Band", *Progress In Electromagnetics Research B*, vol. 78, pp. 91-124, 2017.

[9] **H. Huang**, S.-B. Kim, L. Tsang, X. Xu, T.-H. Liao, T. J. Jackson, and S. Yueh, "Coherent Model of L-Band Radar Scattering by Soybean Plants: Model Development, Evaluation, and Retrieval," in *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, vol. 9, no. 1, pp. 272-284, Jan. 2016.

CONFERENCE PAPERS & ABSTRACTS

[1] **H. Huang**, L. Tsang, A. Colliander, and S. Yueh, "Remote Sensing of Soil Moisture for Vegetation/Forests with Large VWC Using NMM3D Full Wave Simulations", IGARSS, Yokohama, Japan, 2019.

[2] **H. Huang**, L. Tsang, A. Colliander, and S. Yueh, "Full Wave Simulations of Vegetation/Trees Using 3D Vector Cylindrical Wave Expansions In Foldy-Lax Multiple Scattering Equations", ICCEM, Shanghai, China, 2019.

[3] **H. Huang**, L. Tsang, R. Shah, X. Xu and S. Yueh,"Physical Modeling of Vegetation and Forest Effects at P-band for Remote Sensing of Soil Moisture", PIERS, Toyama, Japan, 2018.

[4] **H. Huang**, L. Tsang, A. Colliander, R. Shah and S. Yueh, "NMM3D Full Wave Simulations of Vegetation and Forest Effects In Microwave Remote Sensing", IGARSS, Valencia, Spain, 2018.

[5] S.-B. Kim, **H. Huang** and T.-H. Liao, "Inversion of Physical Models Using L-Band Airborne SAR Data for Soil Moisture Estimates at Field Scale", IGARSS, Valencia, Spain, 2018.

[6] A. Colliander, E. Njoku, **H. Huang** and L. Tsang, "Soil Moisture Retrieval Using Full Wave Simulations of 3-D Maxwell Equations For Compensating Vegetation Effects", IGARSS, Valencia, Spain, 2018.

[7] L. Zhu, J. Walker, L. Tsang, **H. Huang**, N. Ye and C. Rüdiger, "Soil Moisture Retrieval over Agricultural Fields from Time Series Multi-Angular L-Band Radar Data", IGARSS, Valencia, Spain, 2018.

[8] R. Shah, S. Yueh, X. Xu, K. Elder, **H. Huang** and L. Tsang, "Experimental Results of Snow Measurement Using P-Band Signals of Opportunity", IGARSS, Valencia, Spain, 2018.

[9] **H. Huang**, L. Tsang and K.-H. Ding, “Full Wave Solutions of Multiple Scattering Using Vector Spheroidal Waves and Addition Theorem”, APS/URSI, Boston, USA, 2018.

[10] **H. Huang**, L. Tsang, A. Colliander, R. Shah, X. Xu, E. Njoku and S. Yueh, "Numerical 3D Solutions of Maxwell Equations based on Hybrid Method Combining Generalized T matrix and Foldy-Lax Multiple Scattering Theory for Vegetation/Trees Scattering", ICCEM, Chengdu, China, 2018.

[11] **H. Huang,** L. Tsang, A. Colliander, R. Shah, X. Xu, E. Njoku and S. Yueh, "Multiple Scattering of Closely Packed Non-spherical Objects Using Vector Spheroidal Waves and Vector Addition Theorem", ELS-XVII, Texas, USA, 2018.

[12] **H. Huang**, L. Tsang, E. Njoku, A. Colliander, K.-H. Ding and T.-H. Liao, "Hybrid Method Combining Generalized T matrix of Single Objects and Foldy-Lax Equations in NMM3D Microwave Scattering in Vegetation", PIERS, Singapore, 2017.

[13] **H. Huang**, L. Tsang, E. Njoku, A. Colliander, K.-H. Ding and T.-H. Liao, "Scattering of Extended Cylinders Based on Numerical Maxwell Model of 3D (NMM3D) for Vegetation Effects in Microwave Remote Sensing of Soil Moisture", PIERS, Singapore, 2017.

[14] **H. Huang**, L. Tsang, E. Njoku and A. Colliander, "A New Vegetation Model Based on Numerical 3D Solutions of Maxwell Equations", IGARSS, Texas, USA, 2017.

[15] L. Tsang, T.-H. Liao, S. Tan, **H. Huang** and T. Qiao, "Microwave remote sensing of soil, ocean, snow and vegetation based on 3D Numerical Solutions of Maxwell Equations (NMM3D)", IGARSS, Texas, USA, 2017.

[16] **H. Huang**, L. Tsang, T.-H. Liao, E. Njoku, A. Colliander, and K.-H Ding, "Physical Modelling of Vegetation Canopy in Microwave Remote Sensing Using Numerical 3D Solutions of Maxwell Equations", PIERS, St Petersburg, Russia, 2017.

[17] **H. Huang**, L. Tsang, T.-H. Liao, E. Njoku, A. Colliander, and K.-H Ding, "Scattering of Electromagnetic Waves by Vegetation Based on Numerical 3D Solutions of Maxwell Equations", APS/URSI, California, USA, 2017

[18] **H. Huang**, L. Tsang, T.-H. Liao, E. Njoku, A. Colliander, and K.-H Ding, "Full-Wave Simulations of Electromagnetic Scattering by Vegetation for Microwave Remote Sensing Based on Numerical 3D Solutions of Maxwell Equations", URSI GASS, Montreal, Canada, 2017

[19] **H. Huang**, T.-H. Liao, L. Tsang, E. Njoku, A. Colliander, T. J. Jackson, and S. Yueh, "Combined Active and Passive Microwave Remote Sensing of Soil Moisture for Vegetated Surfaces at L-band", IGARSS, Beijing, China, 2016.

[20] **H. Huang**, L. Tsang, and T.-H. Liao, "Multiple Scattering Effects in Vegetated Surfaces at L-band and C-band for Remote Sensing of Soil Moisture", PIERS, Shanghai, China, 2016.

[21] **H. Huang**, S.-B. Kim, L. Tsang, X. Xu, T.-H. Liao, T. J. Jackson, and S. Yueh, "L-Band Radar Scattering of Wheat and Canola for SMAP Applications", IGARSS, Milan, Italy, 2015.

[22] **H. Huang**, X. Xu, and L. Tsang, "Coherent Model of L Band Radar Scattering by Soya Bean Fields Using Analytic Methods and Monte Carlo Simulations", IGARSS, Quebec, Canada, 2014.

[23] **H. Huang**, S Tan, L Tsang, X. Xu, S.-B. Kim, and S. Yueh, "Coherent and Multiple Scattering in Radar Scattering of Vegetated Surfaces at L band for SMAP", PIERS, Guangzhou, China, 2014.

[24] S.-B. Kim, **H. Huang**, L. Tsang, T. J. Jackson, H. MacNairn and J. van Zyl, "Soil Moisture retrieval using L-band time-series SAR data from the SMAPVEX12 experiment", EUSAR 2014, Berlin, Germany.

[25] S.-B. Kim, L. Tsang, T.-H. Liao, **H. Huang** and T. J. Jackson, "Retrieval of soil moisture using airborne synthetic-and real-aperture radar data at different spatial scales", AGU Fall Meeting, San Francisco, USA, 2013.

AWARDS AND HONORS

- Shainin Red X Certificate 2022
- First Prize of Best Student Paper Award of IEEE International Conference on Computational Electromagnetics 2019

- IEEE Antennas and Propagation Society Ulrich L. Rohde Innovative Conference Paper Award on Computational Techniques in Electromagnetics 2018
- APS/URSI Student Paper Contest Honorable Mention 2018, 2019
- Asian Dean's Forum 2018 The Rising Stars Women in Engineering Workshop (Fully Funded) 2018
- ECE Department Nomination for the Towner Prize for Outstanding Ph.D. Research, University of Michigan, Ann Arbor 2018
- Rackham International Travel Grant, University of Michigan, Ann Arbor 2015, 2016, 2017
- ECE Department Fellowship, University of Michigan, Ann Arbor 2015
- IET(The Institution of Engineering and Technology) Prize 2012 – 2013
- Dean's Scholarships College of Engineering, City University of Hong Kong 2011 – 2012
- "We Need U Volunteer Campaign" Good Volunteer Service to the Community 2009 – 2012
- Dean's List of CSE (College of Engineering) 2009 – 2012
- CityU Mainland Student Scholarship Scheme – First Class Scholarship 2008 – 2012
- CityU – EE Student Exchange Scholarships 2011
- Hong Kong Association of University Women Undergraduate Scholarships 2010 – 2011
- Hitachi (H.K.) Ltd. Scholarships 2010 – 2011
- Mr. Ken Leung Memorial Scholarship 2010 – 2011
- Compass Scholarship 2009 – 2010
- The Highest GPA Award of EE Department 2009 – 2010
- Mr. Chan Tai Ho Scholarships of Foundation Year 2008 – 2009