YAGUANG ZHANG

Northwestern Avenue, Box 90, EE Building, Purdue University, West Lafayette, IN 47907
Homepage: yaguangzhang.github.io | Cell: (765) 761-2221 | E-mail: ygzhang@purdue.edu

EDUCATION

Purdue University, West Lafayette, Indiana, USA
PhD in Electrical and Computer Engineering August 2021
- Thesis **Zhang, Y.**, 2021. *Improved site-specific millimeter-wave channel modeling and simulation for suburban and rural environments*. Purdue University Graduate School.

Purdue University, West Lafayette, Indiana, USA
MSc in Electrical and Computer Engineering May 2015

Tianjin University, Tianjin, P.R. China
BEng in Communication Engineering June 2013
- Thesis title *Design and Simulation of LTE Semi-Persistent Scheduler*

University of South Australia, Adelaide, Australia
Exchange Student February – July 2012

RESEARCH INTERESTS

- Sensors, IoT, and Networking Applied to Intelligent Transportation Systems and Precision Agriculture
- UAV-Aided Wireless Communication Systems in Rural Areas
- Millimeter-Wave Channel Measurement and Modeling in Suburban and Rural Environments

RESEARCH EXPERIENCE

[RE1] August 2021 – Present. **Post-Doctoral Research Assistant**. Purdue University, West Lafayette, Indiana, USA.
- *Communications Research Lab*: millimeter-wave propagation measurement and modeling for rural environments; large-scale data-driven simulation for next-generation wireless communications.
- *Open Ag Technology and Systems (OATS) Center*: multi-fleet, multi-field, and multi-year GPS data collection and processing for agriculture applications.
- *Wabash Heartland Innovation Network (WHIN)*: coverage simulation for LoRaWAN performance predication and evaluation.
- *Joint Transportation Research Program (JTRP)*: high-risk road segment identification via sun shadow simulation for proactive snow removal; pavement condition assessment and visualization based on 3D LiDAR and falling weight deflectometer records; automated record keeping for maintenance operations via real-time telematics information.

[RE2] June 2017 – July 2021. **Graduate Research Assistant**. Purdue University, West Lafayette, Indiana, USA.
- *Open Ag Technology and Systems (OATS) Center*: GPS signal processing for agriculture applications.
- *Communications Research Lab*: millimeter-wave propagation modeling for 5G communications.

[RE3] January 2015 – July 2016. **Graduate Research Assistant**. Purdue University, West Lafayette, Indiana, USA.
- *Open Ag Technology and Systems (OATS) Center*: GPS data collection and agricultural vehicle activity recognition for wheat harvesting.
- *Joint Transportation Research Program (JTRP)*: algorithm development for recognizing pothole patching activities via GPS records.

[RE4] June 2012 – July 2012. **Work Experience Program**. Institute for Telecommunications Research, University of South Australia, Mawson Lakes, Australia.
- *Software-Defined Radio*: collaborated with the lab manager to set up and test USRP E110 units.
- *Fading Control, Coding for Hybrid Free Space Optical / RF Channels*: simulated fading channel using Arduino.

TEACHING EXPERIENCE

[TE1] February 2023. **Substitute Instructor**. Purdue University, West Lafayette, Indiana, USA.
- *ECE 302 Probabilistic Methods in Electrical and Computer Engineering*: taught two 50-min lectures in large class settings (over 150 registered students).

[TE2] August 2016 – May 2017. **Graduate Teaching Assistant**. Purdue University, West Lafayette, Indiana, USA.
- *ECE 477 Digital Systems Senior Design*: guided and assisted 10 student groups (4 in Fall 2016 and 6 in Spring 2017) with senior design projects.

[TE3] January 2016 – May 2016. **Teaching Assistant Trainee**. Purdue University, West Lafayette, Indiana, USA.
- *ENGL 620 Classroom Communication in ESL For Teaching Assistants*: designed and delivered 4 talks on selected topics in electrical and computer engineering.

[TE4] July 2011. **Volunteer Teacher**. Jiantang Village Elementary School, Fenghuang County, Hunan Province, China.
- *College Student Summer Service Program*: Taught at a Hope Project school and co-authored a report on local economy and education.

PUBLICATIONS

Magazines

[M1] **Zhang, Y.**, Love, D.J., Krogmeier, J.V., Anderson, C.R., Heath, R.W. and Buckmaster, D.R., 2021. *Challenges and opportunities of future rural wireless communications*. **IEEE Communications Magazine**, 59(12), pp.16-22. DOI: 10.1109/MCOM.001.2100280. [arXiv preprint]

Journals

[J1] Jha, S., **Zhang, Y.**, Park, B., Cho, S., Krogmeier, J.V., Bagchi, T. and Haddock, J., 2023. *Data-driven web-based patching management tool using multi-sensor pavement structure measurements*. To appear in **Transportation Research Record: Journal of the Transportation Research Board**. US National Research Council.

[J2] **Zhang, Y.**, Jyoti, S., Anderson, C.R., Michelusi, N., Love, D.J., Sprintson, A. and Krogmeier, J.V., 2021, July. *Improving millimeter-wave channel models for suburban environments with site-specific geometric features*. **Applied Computational Electromagnetics Society (ACES) Journal**, 34(02), pp. 375–378. [Open access]

[J3] **Zhang, Y.**, Krogmeier, J.V., Ault, A. and Buckmaster, D., 2020. *APT3: automated product traceability trees generated from GPS tracks*. **Transactions of the ASABE**, 63(3), pp.571-582. DOI: 10.13031/trans.13384.

[J4] **Zhang, Y.**, Anderson, C.R., Michelusi, N., Love, D.J., Baker, K.R. and Krogmeier, J.V., 2019, June. *Propagation modeling through foliage in a coniferous forest at 28 GHz*. **IEEE Wireless Communications Letters**, vol. 8, no. 3, pp. 901-904. DOI: 10.1109/LWC.2019.2899299. [arXiv preprint]

Journals Under Review

[JR1] **Zhang, Y.**, Krogmeier, J.V., Anderson, C.R. and Love, D.J. *Large-scale cellular coverage simulation and analyses for follow-me UAV data relay*. Submitted to **IEEE Transactions on Wireless Communications**.

[JR2] Wang, Y., **Zhang, Y.**, Buckmaster, D. and Krogmeier, J.V. *A new methodology for combine performance analyses in wheat harvests with GNSS data*. Submitted to **Journal of the ASABE**.

Journals Under Preparation

[JP1] Keshavamurthy, B., **Zhang, Y.**, Anderson, C.R., Michelusi, N., Krogmeier, J.V. and Love, D.J. *Empirical validation of millimeter wave channel models via a V2X measurement campaign*. To be submitted to **IEEE Transactions on Antennas and Propagation**.

Conferences

[C1] Keshavamurthy, B., **Zhang, Y.**, Anderson, C.R., Michelusi, N., Krogmeier, J.V. and Love, D.J., 2023. *Propagation measurements and analyses at 28 GHz via an autonomous beam-steering platform*. To appear in **2023 IEEE International Conference on Communications (ICC)**. [arXiv preprint]

[C2] Jha, S., **Zhang, Y.**, Park, B., Cho, S., Krogmeier, J.V., Bagchi, T. and Haddock, J.E., 2023. *Data-driven web-based patching management tool using multi-sensor pavement structure measurements*. In **2023 Transportation Research Board (TRB) 102nd Annual Meeting**. TRB. [arXiv preprint]

[C3] **Zhang, Y.**, Krogmeier, J.V., Anderson, C.R. and Love, D.J., 2022. *Overcoming the digital divide by large-scale coverage analyses for mmWave cellular networks*. In **2022 56th Asilomar Conference on Signals, Systems, and Computers** (pp. 1190-1194). IEEE. DOI: 10.1109/IEEECONF56349.2022.10051865.

[C4] Keshavamurthy, B., **Zhang, Y.**, Anderson, C.R., Michelusi, N., Krogmeier, J.V. and Love, D.J., 2022. *A robotic antenna alignment and tracking system for millimeter wave propagation modeling*. In **2022 United States National Committee of URSI National Radio Science Meeting (USNC-URSI NRSM)** (pp. 145-146). IEEE. DOI: 10.23919/USNC-URSINRSM57467.2022.9881448. [arXiv preprint]

[C5] **Zhang, Y.**, Jha, S., Bullock, D.M. and Krogmeier, J.V., 2021, September. *Generating dynamic prescription maps for winter road treatment via sun-shadow simulation*. In **2021 IEEE International Intelligent Transportation Systems Conference (ITSC)** (pp. 3387-3392). IEEE. DOI: 10.1109/ITSC48978.2021.9565055. [Virtual presentation]

[C6] Neustedter, A.J., Arakawa, T., **Zhang, Y.**, Castiblanco, F.A., Layton, A., Balmos, A., Ault, A., Krogmeier, J.V. and Buckmaster, D., 2021. *Enabling visualization and processing of location-based data via OADA's client-selectable live data graphs*. In **2021 ASABE Annual International Virtual Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.202101126.

[C7] **Zhang, Y.**, Tan, J.A., Dorbert, B.M., Anderson, C.R. and Krogmeier, J.V., 2020, December. *Simulation-aided measurement-based channel modeling for propagation at 28 GHz in a coniferous forest*. In **2020 IEEE Global Communications Conference (GLOBECOM)** (pp. 1-6). IEEE. DOI: 10.1109/GLOBECOM42002.2020.9322386. [Virtual presentation]

[C8] **Zhang, Y.**, Arakawa, T., Krogmeier, J.V., Anderson, C.R., Love, D.J. and Buckmaster, D.R., 2020, June. *Large-scale cellular coverage analyses for UAV data relay via channel modeling*. In **2020 IEEE International Conference on Communications (ICC)** (pp. 1-6). IEEE. DOI: 10.1109/ICC40277.2020.9149403. [Virtual presentation]

[C9] Wang, Y., **Zhang, Y.**, Buckmaster, D. and Krogmeier, J., 2019. *Combine harvester unloading event inference using GPS data*. In **2019 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201901286.

[C10] **Zhang, Y.**, Balmos, A., Ault, A., Buckmaster, D. and Krogmeier, J.V., 2018. *Generating product traceability trees for harvesting from GPS tracks*. In **2018 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201800628.

[C11] Lindsay, A.M., Wang, Y., Noel, S., **Zhang, Y.**, Krogmeier, J.V. and Buckmaster, D., 2018. *CAN-based forage yield mapping*. In **2018 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201801016.

[C12] Buckmaster, D., Krogmeier, J.V., Ault, A., Noel, S., Wang, Y., **Zhang, Y.**, Layton, A. and Balmos, A., 2018, June. *Use cases for real time data in agriculture*. In **Proceedings of the 14th International Conference on Precision Agriculture (ICPA)**. International Society of Precision Agriculture. [Open access]

[C13] **Zhang, Y.**, Love, D.J., Michelusi, N., Krogmeier, J.V., Jyoti, S., Sprintson, A. and Anderson, C.R., 2018, March. *Improving millimeter-wave channel models for suburban environments with site-specific geometric features*. In **2018 International Applied Computational Electromagnetics Society Symposium (ACES)** (pp. 1-2). IEEE. DOI: 10.23919/ROPACES.2018.8364140.

[C14] **Zhang, Y.**, Jyoti, S., Anderson, C.R., Love, D.J., Michelusi, N., Sprintson, A. and Krogmeier, J.V., 2018, May. *28-GHz channel measurements and modeling for suburban environments*. In **2018 IEEE International Conference on Communications (ICC)** (pp. 1-6). IEEE. DOI: 10.1109/ICC.2018.8422820.

[C15] **Zhang, Y.**, Balmos, A., Krogmeier, J.V. and Buckmaster, D., 2017. *Dynamic high-precision field shape generation via combine GPS tracks*. In **2017 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201700809.

[C16] **Zhang, Y.**, Ault, A., Krogmeier, J.V. and Buckmaster, D., 2017. *Activity recognition for harvesting via GPS tracks*. In **2017 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201700813.

[C17] Layton, A.W., **Zhang, Y.**, Krogmeier, J.V. and Buckmaster, D.R., 2017. *Determining harvesting efficiency via*

multiple combine GPS logs. In **2017 ASABE Annual International Meeting** (p. 1). American Society of Agricultural and Biological Engineers. DOI: 10.13031/aim.201700816.

[C18] **Zhang, Y.**, Balmos, A., Krogmeier, J.V. and Buckmaster, D., 2015, September. *Working zone identification for specialized micro transportation systems using GPS tracks*. In **2015 IEEE 18th International Conference on Intelligent Transportation Systems (ITSC)** (pp. 1779-1784). IEEE. DOI: 10.1109/ITSC.2015.289.

Technical Reports

[R1] Mahlberg, J., **Zhang, Y.**, Jha, S., Mathew, J.K., Li, H., Desai, J., Kim, W., McGuffey, J., Wells, T., Krogmeier, J.V. and Bullock, D.M., 2021. *Development of an intelligent snowplow truck that integrates telematics technology, roadway sensors, and connected vehicle*. **Joint Transportation Research Program Publication (JTRP) Technical Reports** No. FHWA/IN/JTRP-2021/27. Purdue University, West Lafayette, Indiana. DOI: 10.5703/1288284317355.

[R2] **Zhang, Y.**, Jyoti, S., Anderson, C.R., Love, D.J., Michelusi, N., Sprintson, A. and Krogmeier, J.V., 2017, November. *28-Ghz channel measurements and modeling for suburban environments*. **Department of Electrical and Computer Engineering Technical Reports** No. TR-ECE-17-07. Purdue University, West Lafayette, Indiana. [Open access]

[R3] Sadeghi, L., **Zhang, Y.**, Balmos, A., Krogmeier, J.V. and Haddock, J.E., 2016. *Algorithm and software for proactive pothole repair*. **Joint Transportation Research Program Publication (JTRP) Technical Reports** No. FHWA/IN/JTRP-2016/14. Purdue University, West Lafayette, Indiana. DOI: 10.5703/1288284316337.

Data Sets

[S1] Keshavamurthy, B. and **Zhang, Y.** (2022). *Propagation measurements and analyses at 28GHz on NSF POWDER*. (v1.0) [Data set]. IEEE International Conference on Communications (ICC), Rome, Italy. **Zenodo**. DOI: 10.5281/zenodo.7178597.

[S2] **Zhang, Y.** and Krogmeier, J. (2021). *Combine Kart Truck GPS data archive*. (Version 1.2). **Purdue University Research Repository**. DOI: 10.4231/XBG9-P763.

HONORS AND AWARDS

Student Travel Support 2021
24th IEEE International Intelligent Transportation Systems Conference (ITSC).
IEEE Intelligent Transportation Systems Society (ITSS).

Student Poster Competition First Prize 2020
Dynamic High-Precision Field Shape Generation via Combine GPS Tracks
Unlocking the Agricultural Data Revolution.
Foundation for Food & Agriculture Research (FFAR).

Student Poster Competition Honorary Mention Prize 2020
Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling
Unlocking the Agricultural Data Revolution.
Foundation for Food & Agriculture Research (FFAR).

Student Poster Competition Honorary Mention Prize 2020
Generating Product Traceability Trees for Harvesting from GPS Tracks
Unlocking the Agricultural Data Revolution.
Foundation for Food & Agriculture Research (FFAR).

Student Travel Support 2019
6th Millimeter-Wave Research Coordination Networks (mmW RCN) Workshop.
National Science Foundation (NSF).

Outstanding Student Poster Presentation Award 2018
Generating Product Traceability Trees for Harvesting from GPS Tracks
ASABE Annual International Meeting.
American Society of Agricultural and Biological Engineers (ASABE).

Student Travel Scholarship 2015
18th IEEE International Intelligent Transportation Systems Conference (ITSC).
IEEE Intelligent Transportation Systems Society (ITSS).

Endeavour Awards 2012
Australian Government Scholarship. University of South Australia.

Dean's Award 2012, 2011
School of Electronic Information Engineering. Tianjin University.

China National Scholarship 2012, 2011, 2010
Chinese Government Scholarship. Tianjin University.

Tianjin Area Undergraduate Physics Competition First Prize (top 5%) 2011

SELECTED PRESENTATIONS

Invited Talks

[I1] October 30, 2022. *Overcoming the Digital Divide by Large-Scale Coverage Analyses for mmWave Cellular Networks*. **2022 IEEE 56th Asilomar Conference on Signals, Systems, and Computers**. Pacific Grove, California, USA.

[I2] February 19, 2020. **Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling**. *2020 Global City Teams Challenge (GCTC) Smart Ag & Rural Supercluster Workshop*. Phoenix, Arizona, USA.

[I3] February 13, 2019. *Propagation Modeling Through Foliage in a Coniferous Forest at 28 GHz*. **National Institute of Standards and Technology (NIST)/Institute for Telecommunication Sciences (ITS) Propagation Focus Group Guest Talk**. Delivered remotely.

[I4] January 31, 2018. *28-GHz Channel Measurements and Modeling for Suburban Environments*. **National Institute of Standards and Technology (NIST)/Institute for Telecommunication Sciences (ITS) Propagation Focus Group Guest Talk**. Delivered remotely.

Talks

[T1] February 24, 2023. *Automating Work Orders for Winter Weather Operations Using GPS Tracks*. **2023 Open Ag Technology and Systems Center Conference (OATSCON23)**. Purdue University, West Lafayette, Indiana, USA. Presented by my colleague Aaron Ault (Email: ault@purdue.edu).

[T2] February 24, 2023. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **2023 Open Ag Technology and Systems Center Conference (OATSCON23)**. Purdue University, West Lafayette, Indiana, USA. Delivered virtually.

[T3] March 15, 2023. *Automating Work Orders Using GPS Tracks*. **109th Purdue Road School Transportation Conference and Expo**. Purdue University, West Lafayette, Indiana, USA.

[T4] January 10, 2023. *Data-Driven, Web-Based Patching Management Tool Using Multi-Sensor Pavement Structure Measurements*. **2023 Transportation Research Board (TRB) 102nd Annual Meeting**. Presented by my colleague Sneha Jha (Email: jha16@purdue.edu).

[T5] October 25, 2022. *Web-Based Patching Management Tool using Multi-Sensor Pavement Condition Measurements*. **31st Annual FWD Users Group Meeting**. Reno, Nevada, USA. Presented by my colleague Sneha Jha (Email: jha16@purdue.edu).

[T6] March 15, 2022. *Comprehensive Pavement Patching Tools and Web-Based Software for Pavement Condition Assessment and Visualization*. **108th Purdue Road School Transportation Conference and Expo**. Purdue University, West Lafayette, Indiana, USA. Co-presented with my colleague Sneha Jha (Email: jha16@purdue.edu).

[T7] December 21, 2021. *Rural Wireless Propagation Modeling*. **Internet of Things for Precision Agriculture (IoT4Ag) Industrial/Practitioner Advisory Board (IPAB) Meeting**. Delivered remotely.

[T8] September 22, 2021. *Generating Dynamic Prescription Maps for Winter Road Treatment via Sun-Shadow Simulation*. **2021 IEEE International Intelligent Transportation Systems Conference (ITSC)**. Hybrid conference. Indianapolis, Indiana, USA. Delivered both in person and virtually. [Virtual presentation]

[T9] March 25, 2021. *Automatic Field Records*. **2021 Open Ag Technology and Systems Center Conference**

(OATSCON21). Virtual conference. Purdue University, West Lafayette, Indiana, USA. Delivered remotely.

[T10] December 9, 2020. *Simulation-Aided Measurement-Based Channel Modeling for Propagation at 28 GHz in a Coniferous Forest*. **2020 IEEE Global Communications Conference (GLOBECOM)**. Hybrid conference. Taipei, Taiwan. Delivered virtually. [Virtual presentation]

[T11] November 19, 2020. *GPS Data Analyses for Wheat Harvesting*. **2020 AgGateway Virtual Annual Conference**. Delivered remotely.

[T12] July 8, 2020. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **2020 AgGateway Mid-Year Meeting**. Virtual conference. Delivered virtually. [Virtual presentation]

[T13] June 9, 2020. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **2020 IEEE International Conference on Communications (ICC)**. Virtual conference. Delivered virtually. [Virtual presentation]

[T14] August 29, 2019. *Activity Recognition for Harvesting via GPS Tracks*. **2019 Open Ag Technology and Systems Center (OATS) Showcase Reception for Infosys Limited**. Purdue University, West Lafayette, Indiana, USA.

[T15] August 8, 2019. *Activity Recognition for Harvesting via GPS Tracks*. **2019 Open Ag Technology and Systems Center (OATS) Showcase Reception for Case New Holland Industrial (CHI) Inc**. Purdue University, West Lafayette, Indiana, USA.

[T16] July 10, 2019. *A Probabilistic Model for Estimating Harvested Areas via GPS Tracks*. **2019 ASABE Annual International Meeting (AIM)**. Boston, Massachusetts, USA.

[T17] February 25, 2019. *Generating Product Traceability Trees for Harvesting from GPS Tracks*. **2019 Open Ag Technology and Systems Center Conference (OATSCON19)**. Chicago, Illinois, USA.

[T18] January 9, 2019. *Channel Model Comparison for 28 GHz Millimeter Wave in Suburban and Rural Environments*. **United States National Committee (USNC) for the International Union of Radio Science (URSI) National Radio Science Meeting (NRSM)**. Boulder, Colorado, USA. Presented by Prof. Christopher R. Anderson (Email: canderso@usna.edu).

[T19] May 23, 2018. *28-GHz Channel Measurements and Modeling for Suburban Environments*. **2018 IEEE International Conference on Communications (ICC)**. Kansas City, Missouri, USA.

[T20] March 24, 2018. *Improving Millimeter-Wave Channel Models with Site-Specific Geometric Features*. **2018 International Applied Computational Electromagnetics Society (ACES) Symposium**. Denver, Colorado, USA.

[T21] July 17, 2017. *Activity Recognition for Harvesting via GPS Tracks*. **2017 ASABE Annual International Meeting (AIM)**. Spokane, Washington, USA.

[T22] July 17, 2017. *Determining Harvesting Efficiency via Multiple Combine GPS Logs*. **2017 ASABE Annual International Meeting (AIM)**. Spokane, Washington, USA.

[T23] September 16, 2015. *Working Zone Identification for Specialized Micro Transportation Systems Using GPS Tracks*. **2015 IEEE 18th International Conference on Intelligent Transportation Systems (ITSC)**. Las Palmas de Gran Canaria, Spain.

Poster Presentations

[P1] March 2, 2023. *Development of an Automatic Contextual Agricultural Metadata Collection App*. **Graduate Industrial Research Symposium (GIRS) 2023**. Purdue University, West Lafayette, Indiana, USA. Presented by my colleague Md. Samiul Basir (Email: mbasir@purdue.edu). [First Place in Creating the Farm of the Future]

[P2] February 21, 2023. *Comprehensive Pavement Patching Tools and Web-Based Software for Pavement Condition Assessment and Visualization*. **2023 Joint Transportation Research Program (JTRP) Poster Session**. Indiana Government Center South Atrium, Indianapolis, Indiana, USA. Presented by my colleague Sneha Jha (Email: jha16@purdue.edu).

[P3] February 21, 2023. *Automating Work Orders for Winter Weather Operations Using GPS Tracks*. **2023 Joint Transportation Research Program (JTRP) Poster Session**. Indiana Government Center South Atrium, Indianapolis, Indiana, USA.

[P4] September 9, 2022. *Open-Agriculture Technology and Systems (OATS) Center*. **College of Agriculture Graduate Student Welcoming and Networking Event**. Purdue University, West Lafayette, Indiana, USA. Presented by my

colleague Harsh Pathak (Email: pathak19@purdue.edu).

[P5] February 24, 2022. *Comprehensive Pavement Patching Algorithm for Web-Based Pavement Condition Assessment and Visualization Application*. **2022 Joint Transportation Research Program (JTRP) Poster Session**. Indiana Government Center South Atrium, Indianapolis, Indiana, USA. Presented by my colleague Sneha Jha (Email: jha16@purdue.edu).

[P6] February 24, 2022. *Generating Dynamic Prescription Maps for Winter Road Treatment via Sun Shadow Simulation*. **2022 Joint Transportation Research Program (JTRP) Poster Session**. Indiana Government Center South Atrium, Indianapolis, Indiana, USA.

[P7] October 12, 2021. *Wireless Powered Communication Over Inductively Coupled Circuit*. **Internet of Things for Precision Agriculture (IoT4Ag) Year-1 National Science Foundation (NSF) Site Visit**. University of Pennsylvania, Philadelphia, Pennsylvania, USA. Co-presented with my colleague Tomohiro Arakawa (Email: tomohiro@tarakawa.net). Delivered remotely.

[P8] October 12, 2021. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **Internet of Things for Precision Agriculture (IoT4Ag) Year-1 National Science Foundation (NSF) Site Visit**. University of Pennsylvania, Philadelphia, Pennsylvania, USA. Delivered remotely.

[P9] June 10, 2021. *Wireless Powered Communication Over Inductively Coupled Circuits for UAV Data Relay via Channel Modeling*. **Internet of Things for Precision Agriculture (IoT4Ag) Summer 2021 Annual Meeting**. University of Pennsylvania, Philadelphia, Pennsylvania, USA. Co-presented with my colleague Tomohiro Arakawa (Email: tomohiro@tarakawa.net). Delivered remotely.

[P10] June 10, 2021. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **Internet of Things for Precision Agriculture (IoT4Ag) Summer 2021 Annual Meeting**. University of Pennsylvania, Philadelphia, Pennsylvania, USA. Delivered remotely.

[P11] September 25, 2020. *Dynamic High-Precision Field Shape Generation via Combine GPS Tracks*. **2020 Unlocking the Agricultural Data Revolution**. University of Minnesota, Minneapolis, Minnesota, USA. [Student Poster Competition First Prize] [Announcement archive]

[P12] September 24, 2020. *Large-Scale Cellular Coverage Analyses for UAV Data Relay via Channel Modeling*. **2020 Unlocking the Agricultural Data Revolution**. University of Minnesota, Minneapolis, Minnesota, USA. [Student Poster Competition Honorary Mention Prize]

[P13] September 24, 2020. *Generating Product Traceability Trees for Harvesting from GPS Tracks*. **2020 Unlocking the Agricultural Data Revolution**. University of Minnesota, Minneapolis, Minnesota, USA. [Student Poster Competition Honorary Mention Prize]

[P14] July 30, 2019. *Wireless Connectivity for Agricultural IoT Devices*. **2019 Facebook Connectivity Lab Summer Workshop on Rural Connectivity**. Menlo Park, California, USA. Presented by my colleague Tomohiro Arakawa (Email: tomohiro@tarakawa.net).

[P15] July 23, 2019. *Propagation Modeling Through Foliage in a Coniferous Forest at 28 GHz*. **6th National Science Foundation (NSF) Millimeter-Wave Research Coordination Networks (mmW RCN) Workshop**. National Institute of Standards and Technology (NTIA), Boulder, Colorado, USA.

[P16] February 25, 2019. *Dynamic High-Precision Field Shape Generation via Combine GPS Tracks*. **2019 Open Ag Technology and Systems Center Conference (OATSCON19)**. Chicago, Illinois, USA.

[P17] February 25, 2019. *Generating Product Traceability Trees for Harvesting from GPS Tracks*. **2019 Open Ag Technology and Systems Center Conference (OATSCON19)**. Chicago, Illinois, USA.

[P18] July 31, 2018. *Generating Product Traceability Trees for Harvesting from GPS Tracks*. **2018 ASABE Annual International Meeting (AIM)**. Detroit, Michigan, USA. [Outstanding Student Poster Presentation Award]

[P19] July 31, 2018. *Activity Recognition for Harvesting via GPS Tracks using Neural Networks*. **2018 ASABE Annual International Meeting (AIM)**. Detroit, Michigan, USA.

[P20] January 18, 2018. *Improving Millimeter-Wave Channel Models with Site-Specific Geometric Features*. **3rd National Science Foundation (NSF) Millimeter-Wave Research Coordination Networks (mmW RCN) Workshop**. Tucson, Arizona, USA.

[P21] November 11, 2017. *Dynamic High-Precision Field Shape Generation via Combine GPS Tracks*. **2017 Open Ag Technology and Systems Center Annual Conference (OATSCON17)**. Chicago, Illinois, USA.

[P22] July 18, 2017. *Dynamic High-Precision Field Shape Generation via Combine GPS Tracks*. **2017 ASABE Annual International Meeting (AIM)**. Spokane, Washington, USA.

Live Demos

[D1] March 15, 2023. *Automating Work Orders Using GPS Tracks*. **109th Purdue Road School Transportation Conference and Expo**. Purdue University, West Lafayette, Indiana, USA.

[D2] March 15, 2022. *Patching Management Tool (PMT): A Comprehensive Web App for Pavement Condition Assessment and Visualization*. **108th Purdue Road School Transportation Conference and Expo**. Purdue University, West Lafayette, Indiana, USA. Co-presented with my colleague Sneha Jha (Email: jha16@purdue.edu).

[D3] August 23, 2019. *ISOBlue HD: An Open-Source Ag Data Collection Platform with Live Video Streaming Capability*. **2019 Joint Transportation Research Program (JTRP) Executive Committee Meeting**. Indiana Corn and Soybean Innovation Center, Purdue University, West Lafayette, Indiana, USA. Co-presented with my colleague Yang Wang (Email: wang701@purdue.edu).

[D4] September 13, 2016. *College of Engineering Space and Data Mapping Program: Live Demo for Purdue Room Info Viewer (Stage 3)*. **College of Engineering Space Committee Meeting**. Purdue University, West Lafayette, Indiana, USA. [Demonstration video]

SERVICES

Peer Reviews

IEEE Vehicular Technology Magazine	2023
IEEE Communications Magazine	2022
IEEE Asilomar Conference on Signals, Systems, and Computers	2022
Pre-submission peer review of a manuscript for **American Society of Agricultural and Biological Engineers (ASABE) Journal** on *Safety and Health*	2022
Military Communications Conference (MILCOM)	2022, 2021, 2019, 2018, 2016
IEEE International Conference on Intelligent Transportation Systems (ITSC)	2021
European Association for Signal Processing (EURASIP) Journal on *Wireless Communications and Networking*	2020
IEEE Global Communications Conference (GLOBECOM)	2020
International Telecommunication Union (ITU) Journal: *Information and Communication Technology (ICT) Discoveries special issue on Radio wave propagation*	2019
IEEE Journal on Selected Areas in Communications (JSAC) special issue on *Multiple Antenna Technologies for Beyond 5G*	2019
IEEE Access	2017

Professional Community

[PC1] May 2022 – August 2022. **Technical Program Committee (TPC) Member**. *Military Communications Conference (MILCOM) 2022 Track 1 – Waveforms and Signal Processing*. Institute of Electrical and Electronics Engineers (IEEE).

[PC2] July 2021 – September 2021. **Technical Program Committee (TPC) Member**. *Military Communications Conference (MILCOM) 2021 Track 1 – Waveforms and Signal Processing*. Institute of Electrical and Electronics Engineers (IEEE).

[PC3] May 2019 – July 2019. **Technical Program Committee (TPC) Member**. *Military Communications Conference (MILCOM) 2019 Track 1 – Waveforms and Signal Processing*. Institute of Electrical and Electronics Engineers (IEEE).

[PC4] May 2018 – July 2018. **Technical Program Committee (TPC) Member**. *Military Communications Conference (MILCOM) 2018 Track 1 – Waveforms and Signal Processing*. Institute of Electrical and Electronics Engineers (IEEE).

Purdue University

[PU1] March 2023. **Committee Member**. *Outstanding Faculty Mentor Award 2023 Selection Committee*. Elmore Family School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, USA.

[PU2] July 28 – 29, 2022. **Presentation Judge**. *2022 Summer Undergraduate Research Fellowship (SURF) Symposium*. Engineering Undergraduate Research Office (EURO), Purdue University, West Lafayette, Indiana, USA.

[PU3] April 2022 – August 2022. **Volunteer**. *Purdue OATS DataStation (POD) Team – Sensor Deployment and Data Analysis*. Purdue University, West Lafayette, Indiana, USA.

[PU4] November 5, 2021. **Volunteer**. *2021 Open Ag Technology and Systems Center Advance Conference* (OATSADVANCE21), Purdue University, West Lafayette, Indiana, USA.

[PU5] July 29 – 31, 2021. **Presentation Judge**. *2021 Summer Undergraduate Research Fellowship (SURF) e-Symposium*. Engineering Undergraduate Research Office (EURO), Purdue University, West Lafayette, Indiana, USA.

[PU6] May 2021 – July 2021. **Mentor**. *2021 Summer Undergraduate Research Fellowship (SURF) Program*. Engineering Undergraduate Research Office (EURO), Purdue University, West Lafayette, Indiana, USA.

[PU7] September 2014. **Volunteer**. *Big Ten+ Graduate School Exposition*. Purdue University, West Lafayette, Indiana, USA.

[PU8] August 2014 – December 2014. **Note Taker**. *Disability Resource Center (DRC)*. Purdue University, West Lafayette, Indiana, USA.

[PU9] August 2014 – December 2014. **Mentor**. *eMentoring Program*. Purdue University Graduate School, West Lafayette, Indiana, USA.

[PU10] August 2014. **Volunteer**. *International Student Orientation*. School of Electrical and Computer Engineering, Purdue University, West Lafayette, Indiana, USA.

General Community

[GC1] December 2022 – Present. **Postdoctoral Scholar Counselor**. *Student Leadership Council (SLC)*. Internet of Things for Precision Agriculture (IoT4Ag) Engineering Research Center, Purdue University, West Lafayette, Indiana, USA.

[GC2] September 2022 – October 2022. **Mentor**. *Pathway to Ph.D. (PPP) Program*. Internet of Things for Precision Agriculture (IoT4Ag) Engineering Research Center, University of Pennsylvania.

[GC3] June 14 – 17, 2022. **Volunteer** and **Poster Competition Judge**. *Internet of Things for Precision Agriculture (IoT4Ag) Summer 2022 Annual Meeting*. Purdue University, West Lafayette, Indiana, USA.

[GC4] October 2021 – December 2021. **Mentor**. *United States Naval Academy (USNA) Longmont Measurement Campaign and Student Seminar*. Wireless Measurements Group at the USNA.

[GC5] September 2021 – October 2021. **Mentor**. *Pathway to Ph.D. (PPP) Program*. Internet of Things for Precision Agriculture (IoT4Ag) Engineering Research Center, University of Pennsylvania.

[GC6] May 2021 – July 2021. **Mentor**. *2021 Research for Undergraduate Experience (REU) Program*. Internet of Things for Precision Agriculture (IoT4Ag) Engineering Research Center, University of Pennsylvania.

[GC7] April 2014. **Tech Support Volunteer for Seniors**. *University Place*. West Lafayette, Indiana, USA.

[GC8] July 2011. **Volunteer Teacher**. *Jiantang Village Elementary School*. Fenghuang County, Hunan Province, China.

[GC9] March 2010. **Community Library Volunteer**. *Young Volunteers Association*. Tianjin, China.

[GC10] September 2009 – July 2010. **Volunteer Student Counsellor**. *Tianjin University*. Tianjin, China.

PROFESSIONAL DEVELOPMENT

Society Memberships

Member	2022 – Present
Institute of Electrical and Electronics Engineers (IEEE)	
Student Member	2021, 2015
IEEE Intelligent Transportation Systems Society (ITSS)	
Student Member	2018 – 2021
IEEE Communications Society (ComSoc)	
Member	2018
Applied Computational Electromagnetics Society (ACES)	
Student Member	2017 – 2020
American Society of Agricultural and Biological Engineers (ASABE)	
Student Member	2015 – 2021
Institute of Electrical and Electronics Engineers (IEEE)	

Career Development

[CD1] February 9, 2023. **Sponsored Attendee**. *Effective and Inclusive Mentoring Workshop*. Center for Teaching and Learning, University of Pennsylvania, Philadelphia, Pennsylvania, USA. Attended remotely.

[CD2] June 14 – 17, 2022. **Sponsored Attendee**. *Internet of Things for Precision Agriculture (IoT4Ag) Summer 2022 Annual Meeting*. Purdue University, West Lafayette, Indiana, USA.

[CD3] April 2022 – August 2022. **Mentee**. *Engineering Academic Career Club (EACC) Mentoring Circles* (Future Faculty Development Program). Purdue University, West Lafayette, Indiana, USA.

[CD4] January 2022 – May 2022. **Trainee**. *Effective Management* (Professional Development Program). Purdue University, West Lafayette, Indiana, USA.

[CD5] November 9 – 10, 2021. **Sponsored Attendee**. *Aerial Experimentation and Research Platform on Advanced Wireless (AERPAW) Fall 2021 Event*. North Carolina State University, Raleigh, North Carolina, USA. [Event Information]

- Attended hands-on trainings on how to access the aerial wireless experimentation platform AERPAW and run experiments.
- Attended the Sixth Generation Wireless Research at North Carolina State University (6GNC) Meeting.

[CD6] November 1 – 3, 2021. **Sponsored Attendee**. *Young Gladiators Colosseum Master Class*. Institute for the Wireless Internet of Things, Northeastern University, Boston, Massachusetts, USA. [Program Information]

- Attended hands-on trainings on how to access the wireless emulator Colosseum and run experiments.
- Visited the Institute for the Wireless Internet of Things and the Colosseum Facility at Northeastern University.

[CD7] September 23 – 26, 2021. **Trainee**. *Mentoring Training for Pathway to Ph.D. (PPP) Mentors*. University of Pennsylvania, Philadelphia, Pennsylvania, USA. Attended remotely.

- Learnt the roles and responsibilities of PPP mentors.

[CD8] March 27, 2021. **Trainee**. *Mentoring Moments Workshop for Summer Undergraduate Research Fellowship (SURF) Mentors*. Purdue University, West Lafayette, Indiana, USA.

- Learnt various techniques to better build relationships with mentees.

[CD9] March 24 – 26, 2021. **Team Leader**. *OATSCON21 Pork Hackathon Part 1: Advance Shipping Notice (ASN)*. Purdue University, West Lafayette, Indiana, USA.

- Pork ASN Web/Slack Chatbot: led a student team to develop and implement two intelligent chatbots for human operators/managers to easily take advantage of an ASN system. [Presentation]

[CD10] November 16 – 19, 2020. **Sponsored Speaker**. *2020 AgGateway Annual Meeting and Conference*. Virtual conference. [Gateway to Ag Careers Cohort Member Certificate]

[CD11] October 2020 – December 2020. **Team Leader**. Team OATS, *Producer-Led Innovation Challenge* hosted by AgriNovus, Indiana, USA.

- OATS Data Automation Platform: led international students and developers from five different countries in developing an open-source project for agricultural data automation. [Executive summary] [Presentation]

Selected Programming Projects

[PP1] **[Matlab] Automating Work Orders using GPS Tracks**: Matlab scripts to fully automate work order verification and partially automate work order generation for Indiana Department of Transportation (INDOT) winter operations using GPS tracks.
Zhang, Y. (2022). **Automating Work Orders using GPS Tracks**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/IndotActivityMatlabWorkspace

[PP2] **[C, C++, Matlab] NTIA Extended Hata (eHata) Urban Propagation Model for Matlab**: C shared library (loadable by Matlab) of the NTIA eHata model C++ implementation.
Zhang, Y. (2022). **NTIA Extended Hata (eHata) Urban Propagation Model for Matlab**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/ntiaEHataForMatlab

[PP3] **[Matlab] Sun Shadow Simulator**: an open-source Matlab codebase to locate sun shadow (e.g., for a given location at a given time) based on LiDAR data.
Zhang, Y. (2021). **Sun Shadow Simulator (Matlab Workspace)**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/SunShadowSimulatorMatlabWorkspace

[PP4] **[Matlab, Python, C++] Cellular Coverage Mapper for Drone Data Relay**: an open-source Matlab codebase for large-scale quantitative coverage analysis of cellular networks with drone data relay.
Zhang, Y. (2020). **Cell Coverage Mapper for Drones (Matlab Workspace)**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/CellCoverageMapperForDronesMatlabWorkspace

[PP5] **[Matlab] EARS Measurement Campaign Code**: code used in data collection and post-processing for a millimeter-wave measurement campaign on the campus of United States Naval Academy, Annapolis, Maryland, USA, to investigate millimeter-wave propagation in suburban environments.
Zhang, Y. (2019). **EARS Measurement Campaign Code**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/EarsMeasurementCampaignCode

[PP6] **[Matlab] Wheat Harvesting GPS Data Visualization and Analysis (Matlab Workspace)**: an open-source Matlab codebase for wheat harvesting GPS analysis, featuring fully automatic algorithms for high-precision field shape generation, vehicle activity recognition, and product tracking & tracing.
Zhang, Y. (2019). **GPS Data Visualization and Analysis Workspace**. *GitHub repository*. Retrieved from https://github.com/YaguangZhang/GpsDataVisualizationAndAnalysisWorkspace

[PP7] **[Android] Combine Kart Truck: A GPS Logger for Wheat Harvesting**: an open-source GPS/Cell/Wi-Fi logger with user registration function for wheat harvesting.
Zhang, Y., Balmos, A. (2019). **Combine Kart Truck**. *GitHub repository*. Retrieved from https://github.com/OATS-Group/CombineKartTruck

SKILL SETS

Language skills	Mandarin (native) and English	
Computer skills	Programming:	Python, C/C++**,** JAVA**,** Android**,** assembly language, Verilog, VHDL
	Signal Processing:	MATLAB, GNU Radio
	Web Development:	JavaScript, NodeJS, ReactJS, HTML/CSS, Docker, Jekyll, Markdown