JINBANG FU

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EDUCATION

Georgia Institute of Technology *Atlanta, GA*
PhD of Electrical and Computer Engineering; GPA 4.0/4.0 *Aug. 2017 - Aug. 2022 (Expected)*

University of Massachusetts Amherst *Amherst, MA*
Bachelor's of Electrical and Computer Engineering *Sep. 2014 - May. 2017*
Graduate with the honor of Summa Cum Laude; GPA 3.945/4.0

TECHNICAL SKILLS

MATLAB, Python, C, C++, ARM, JAVA, Verilog HDL, PSpice, Multisim, Proteus, Altera Quatus, Altium Designer, VNA, SA.

RESEARCH INTERESTS

Wireless Communication, Chip-to-Chip Communication, THz Channel Characterization, THz Channel Modeling, Communication System Desgin, Signal Processing.

RELEVANT COURSES

Personal and Mobile Communication, Coding Theory and Application, Digital Communications, Random Process, Advanced Digital Signal Processing, Statistical Machine Learning, Image Processing, Applied Electromagnetics, EM Radiation and Antennas.

RESEARCH EXPERIENCE

Georgia Institute of Technology *Atlanta, GA*
Graduate Research Assistant

- Led and designed the characterization research of THz wireless communication channel inside a desktop size metal cavity. This work focused on the performance of the wireless channel under the scenarios of line of sight (LoS), Reflected-LoS (RLoS), Obstructed-LoS (OLoS), and Non-LoS (NLoS) propagation. The results were reported in the 13th European Conference on Antennas and Propagation (EuCAP 2019) and published in the IEEE Transactions on Antennas and Propagation..
- Proposed and derived a new path loss model for THz wireless communication inside a metal cavity for both far-field and near-field scenarios. This new model consists of traveling loss, resonant modes-based power variation, and the loss due to the radiation pattern of the equipped directional antennas. The new model was reported in the 14th and 15th European Conference on Antennas and Propagation (EuCAP 2020, 2021).
- Constructed and proposed a geometry based statistical channel model for THz wireless communication in a desktop size metal cavity. This model can be expressed as the superposition of LoS, single bounced (SB), double bounced (DB), and multi-bounced (MB) rays. The model was reported in the AP-S 2019 and published in the IEEE Transactions on Wireless Communications.
- Led and designed the measurement campaign and modeling of THz channel in a motherboard desktop environment with the consideration of different possible scenarios. Proposed and implemented the Gamma mixture model on the path loss variation over the frequency band. Modeled the mean path loss changes w.r.t. the antenna heights through the calculation of resonant modes distribution inside the cavity. Described the PDP files with modified S-V model. The results were written in a paper and submitted to a special section of Radio Science.

- Designed a MLP neural network to model the path loss of THz wireless channel in a motherboard desktop environment. The new model has a good fit to the measured results and outperforms the statistical model (Gamma & Gaussian mixture models). The results were written in a paper and submitted to the 16th European Conference on Antennas and Propagation (EuCAP 2022).

University of Massachusetts Amherst *Amherst, MA*
Undergraduate Research Assistant

- Designed and fabricated a pulse oximeter for the Polymer Science Department of UMass Amherst. The circuit design is based on different absorption of Oxyhemoglobin and Deoxyhemoglobin to red and infrared light. The fabricated pulse oximeter performs very well and accepted by the Polymer Science Department of UMass Amherst.
- Improved the performance of the pulse oximeter by reducing the flicker noise. The chopping technique was implemented by up-converting the signal to high frequency before the amplifier in first stage and down-converting it after the amplifier to reduce the effect of flicker noise at low frequency. The results shown that this technique can effectively reduce the flicker noise by 17 dB. The results were organized and reported to the school.

PUBLICATIONS

Journal Papers

- **J. Fu**, P. Juyal and A. Zajić, "THz Channel Characterization of Chip-to-Chip Communication in Desktop Size Metal Enclosure," in IEEE Transactions on Antennas and Propagation, vol. 67, no. 12, pp. 7550-7560, Dec. 2019.
- **J. Fu**, P. Juyal and A. Zajić, "Modeling of 300 GHz Chip-to-Chip Wireless Channels in Metal Enclosures," in IEEE Transactions on Wireless Communications, vol. 19, no. 5, pp. 3214-3227, May 2020.
- **J. Fu**, P. Juyal and A. Zajić, "Generalized modeling and propagation characterization of THz wireless links in computer desktop environment," in Radio Science, vol. 57, no. 4, pp. 1-26, April 2022.

Conference Papers

- **J. Fu**, P. Juyal and A. Zajić, "300 GHz Channel Characterization of Chip-to-Chip Communication in Metal Enclosure," 2019 13th European Conference on Antennas and Propagation (EuCAP), Krakow, Poland, 2019, pp. 1-5.
- **J. Fu**, P. Juyal and A. G. Zajić, "Path Loss Model as a Function of Antenna Height for 300 GHz Chip-to-Chip Communications," 2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Atlanta, GA, USA, 2019, pp. 1-2.
- **J. Fu**, P. Juyal and A. Zajić, "Modeling of Power Delay Profile in the Desktop Size Metal Cavity at 300 GHz," 2019 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Atlanta, GA, USA, 2019, pp. 2081-2082.
- **J. Fu**, P. Juyal and A. Zajić, "Investigation of Resonance Based Propagation Loss Modeling for THz Chip-to-Chip Wireless Communications" 2020 14th European Conference on Antennas and Propagation (EuCAP). IEEE, pp. 1-5.
- Juyal, Prateek, **J. Fu**, and Alenka Zajic. "Effects of Modes on THz Wireless Channels Inside Metal Enclosures."
- **J. Fu**, P. Juyal and A. G. Zajić, " The Parameters Determination of Path Loss Model for THz Chip-to-Chip Wireless Communications," 2020 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting.
- **J. Fu**, P. Juyal and A. Zajić, "Near Field Modeling for THz Wireless Channel in Nettop Size Metal Enclosures," 2021 15th European Conference on Antennas and Propagation (EuCAP), 2021, pp. 1-5.
- **J. Fu**, P. Juyal, E. Jorgensen, and A. Zajić, "Comparison of Statistical and Deep Learning Path Loss Model for Motherboard Desktop Envrionment" 2020 14th European Conference on Antennas and Propagation (EuCAP). IEEE, pp. 1-5.
- **J. Fu**, P. Juyal, E. Jorgensen, and A. Zajić, "Deep Learning Modeling of Power Delay Profile in Motherboard Desktop Environment," 2022 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Denver, CO, USA, 2022.