Bowen Zhong

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Address: Harbin, Heilongjiang, China

Education

Harbin Institute of Technology, China
Master of Information and Communication Engineering 2018.09 - 2020.07

- Earned Graduate GPA 83.76/100 Ranking: 17/63

Harbin Institute of Technology, China
Bachelor of Telecommunication Engineering 2014.09 - 2018.07

- Earned Undergraduate GPA 85.98/100 Ranking: 23/103

Research Experience

Master Project – **Research on Combining and Precoding Algorithms in Cell-Free Massive MIMO System**
2019.06 - 2020.06
Background: Developing from the distributed Massive MIMO system, the Cell-Free Massive MIMO system gradually becomes one of the most promising structures for the next generation mobile communication system.

- Analyzed the model of Cell-Free Massive MIMO system and simulated the downlink and uplink spectrual efficiency with different precoding and combining algortihms when considering fronthaul limitaion
- Designed a precoding and combining scheme based on Convolutional Neural Network, which improves spectrual efficiency of the system while maintaining a relatively low computation complexity
- Proposed a novel user-centric architecture to solve scability problem faced by Cell-Free Massive MIMO system, and optimized the AP selection schemes

Advisor: Prof. Shaochuan Wu

Embedded Ad-hoc Communication Network with LoRa Protocol 2018.06-2019.03
Background: Designed communication network for decentralized circumstance using LoRa, which is a popular communication protocol widely used in IoT systems

- Employed AODV as routing protocol and included CSMA in MAC protocol
- Improved the robustness of Ad-hoc network with a feedback scheme
- Able to set up center nodes if needed and communicate with the cloud server, which is a competent design for a variety of IoT scenarios

Advisor: Prof. Shaochuan Wu

Undergraduate Project –**Channel Estimation and Demodulation Schemes for MIMO System with Nonlinear PAs** 2017.09-2018.06
Background: Power amplifier's nonlinearity causes the distortion of the transmitting signal in wireless communication systems, including MIMO systems.

- Employed the support vector regression (SVR) algorithm to fit the nonlinearity of the power amplifier in the MIMO system and compensate for the nonlinearity after the channel estimation
- Designed an asymmetric demodulation method based on K-means clustering in order to eliminate the effect of

nonlinearity on demodulation, which turns out to outperform tradational demodulation methods

- Conducted hardware experiments based on universal software radio peripheral(USRP) to verify the proposed algorithms

Advisor: Prof. Wenbin Zhang & Prof. Shaochuan Wu

Award-winning Work -**A Remote Teaching System for Electric Piano** 2017.05-2017.09

Background: Designed and built a novel remote teaching system for electric piano based on FPGA and embedded system

- Able to transmit real-time key-press information between users, and control any piano in the system to play automatically
- Win the first prize (champion) of 2017 National Undergraduate IOT Design Contest

Advisor: Prof. Shengyang He

Conference Publications

Bowen Zhong, Wenbin Zhang, Shaochuan Wu, et al. SVR Based Nonlinear PA Equalization in MIMO System with Rayleigh Channel. The 8th International Conference on Communications, Signal Processing, and Systems (CSPS), 2019, pp 1900-1907

Patents

Yuzhao Zhou**,** Shengyang He**, Bowen Zhong**, et al. A Remote Teaching System for Electric Piano. Chinese Patent: CN107204135A

Internship

Baseband Processing Algorithm Engineer, Hisilicon, China 2019.06 - 2019.09

- Attended training for baseband processing algorithm engineer
- Participated in a V2X system baseband chip design project and finished system simulation of DFT-Spread OFDM algorithm

Awards & Achievements

Excellent Master Thesis	2020
National Graduate Electronic Design Contest, Provincial First Prize	2019
First class scholarship for graduate students	2018&2019
Excellent Undergraduate Thesis	2018
Innovation and Entrepreneurship Scholarship, by MIIT of China	2017
National Undergraduate IoT Design Contest, the First Prize	2017
Interdisciplinary Contest In Modeling, Honorable Mention	2017

Skills

C • Python • Matlab • Verilog • LabVIEW • Altium Designer • Adobe Premiere