

# Xinyang Huang

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## EDUCATION

**University of Electronic Science and Technology of China, Chengdu, China** Sept. 2017 – Jul. 2021 (Expected)  
Bachelor of Science in Network Engineering, School of Information and Communication Engineering

**Overall GPA: 3.88/4.0 Average Mark: 88.29**

**Relevant Coursework:** Principle of Communications (96/100), Graphic Theory (92/100), Network System Engineering (94/100), Integrated Design (100/100), Mobile Communication Systems (96/100), Mathematical Experimentation (98/100).

## RESEARCH EXPERIENCE

**Multi-mode Intelligent Sensing Terminal Autonomous Collaboration Technology,  
Smart Network and Application Team, Department of Network Engineering, UESTC** **Chengdu, China**  
*Researcher and team leader, Advisor: Professor Shizhong Xu* May 2019 – Present

- Designed a PSO-based cluster routing protocol for wireless sensor networks. Compared to popular clustering protocols like LEACH and similar protocols like EC-PSO, our algorithm increases the network lifetime by 110.4% and 23.4%. The protocol introduces the following methods:
  - Modeling network energy consumption and introducing virtual cluster heads to apply the PSO algorithm.
  - Optimizing the original PSO algorithm and introducing multi-dimensional parameters.
- Used Python and OMNET to simulate the protocol and used GD32 to make a smart gateway.
- Currently writing papers and patents and conducting experimental applications in Dali, Yunnan.

## INTERN EXPERIENCE

**802.11 MAC Protocol Analysis** **Huawei, China**  
*Group member, Director: Chenggang Jiang* Aug. 2020 – Nov. 2020

- Analyzed and summarized the authentication and key interaction methods in 802.11 and participated in maintaining the existing access network project.
- Researched the 802.11ax protocol and collaborated on the programming of a new generation wireless router.

## COMPETITIONS

**Wearable Intelligent Guide Device | "Internet +" Innovation Competition** **Chengdu, China**  
*Team leader, Advisor: Professor Zhuming Chen & Professor Yubai Li* Oct. 2018 – Oct. 2019

- Designed a Thermal Imaging Vision & Ultrasonic Obstacle Avoidance System which recognized obstacle types through neural network algorithms and measured distance to obstacles via the ultrasound system with an accuracy of 1 cm.
- Designed GPS & Inertial Navigation & Vision Navigation System which navigated by calling a navigation app software interface and achieved accurate velocity measurement via EKF algorithm and Kalman filter. Indoor navigation system error was  $\pm 50$  cm without visual calibration and  $\pm 15$  cm with visual calibration.
- Aided in preparing a business plan and eventually applying for a patent.

**Internet-based Signal Transmission System | National Electronic Design Competition** **Chengdu, China**  
*Team leader, Advisor: Professor Zhongxiao Yang* Mar. 2019 – Aug. 2019

- Designed a long-distance synchronous sampling system based on PTP and TCP/IP protocols using STM32&DB83640.
- Achieved an error below 5% between the reproduced signals, less than 10ms sync time error, and under 20 MHz/s signal sampling rate.

## PROJECTS

**Design of Adaptive MIMO Link Based on LTE** **Chengdu, China**  
*Team leader, Advisor: Professor Shaoqian Li & Xia Lei* Apr. 2020 – Jul. 2020

- Designed and used MATLAB to simulate LTE-4G basic system, involving Rayleigh channel and  $4 \times 4$  MIMO link.
- Improved the Chow adaptive link algorithm by updating a recursive formula. The final system reached an error rate of less than  $10^{-5}$  (receiver's SNR is 15dB,  $4 \times 4$  MIMO link) which was 10 times lower than the original algorithm.

## **Integrated Design of Campus Backbone Network System**

**Chengdu, China**

*Researcher, Advisor: Professor Jian Sun*

Apr. 2020 – Jul. 2020

- Designed the access network plan for the UESTC student accommodation area including IP address planning, VLAN planning, and switch layout.
- Helped maintain the campus access network and used Wireshark to detect the location and cause of the faulty switch.
- Improved campus web servers and routinely checked system logs, such as educational affairs database log.

## **Long-distance Anti-interference Communication System for Rescue and Disaster Relief**

**Chengdu, China**

*Team leader, Advisor: Professor Zhizhong Fu*

Jul. 2019 – Jan. 2020

- Developed a QPSK-based image transmission protocol using MATLAB & Simulink with a bit error rate of less than 0.0003 (receiver's SNR is 10dB).
- Introduced LMS filter algorithm and sliding filter algorithm in FM communication, thereby reducing in-band noise.

## **Digital Musical Instrument Based on MATLAB**

**Chengdu, China**

*Team leader, Advisor: Professor Chang Wu*

Apr. 2019 – Jun. 2019

- Synthesized different instrument sounds (piano, guitar, bass, violin, and drum) in time and frequency domains by analyzing physical sound mechanisms of the instrument; wrote digital reverbs and equalizers to modify the sound effects.
- Used FL Studio to compose digital synthesized sounds into tracks; adjusted them in real-time using MATLAB.

## **Design of Network Node Model Based on TCP/IP Protocol Stack**

**Chengdu, China**

*Team leader, Advisor: Professor Jingshan Duan*

Feb. 2019 – June 2019

- Designed a three-layer computer network protocol stack which is a TCP / IP-like protocol.
- Implemented IP addressing and RIP routing at the network layer, flow control, error control, data framing at the data link layer, and simple channel coding at the physical layer.
- Designed nodes that can adapt to different network topologies and successfully transmit messages like text and images.

## **Digital Oscilloscope & Spectrum Analyzer using STM32**

**Chengdu, China**

*Programming, Advisor: Professor Zhongxiao Yang*

June 2018 – Aug. 2018

- Used FFT algorithm and energy spectrum calibration algorithm to measure the signal spectrum, improving spectral resolution by 80% (4096-point FFT, 20kHz sampling rate, increased resolution from 5Hz to 1Hz).
- Wrote the driver between the modules (ADC, LCD, SPI, IIC, etc.) in the device.

## **ACHIEVEMENTS & HONORS**

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### **Patent**

- A Wearable Intelligent Blind Guide Device (Current status: publication of invention patent application), Patent number: CN201910639192.3 (4<sup>th</sup> author).

### **Awards**

- Outstanding Academic Scholarship of UESTC for full 3 academic years 2017-2018, 2018-2019, 2019-2020
- Sichuan Innovation and Entrepreneurship Excellent Project twice (top 1%) 2019-2020
- National Innovation and Entrepreneurship Excellent Project (top 1%) 2018-2019
- Second prize in "Challenge Cup" Science and Technology Competition (Sichuan Division) (top 1%) Jul. 2019
- Third prize in "Internet +" Innovation Competition (Sichuan Division) (top 3%) Oct. 2019
- Second prize in Electronic Design Competition of southwest China (top 2%) Aug. 2018

## **SKILLS & INTERESTS**

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- Programming Languages: C/C++, MATLAB, Python, SQL, Verilog.
- Professional Software: Simulink, Keil, Multisim, Vivado, Wireshark, OpenNet, OMNet.
- Interests: Bass, Piano, Harmonica, Arranger, Basketball.