

Personal Information

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Education

2013 – **Nanyang Technological University, Singapore.**
present 2nd-year MEng student in wireless communications, School of EEE
Supervisor: Prof. YONGLIANG GUAN & Prof. Dmitriy Garmatyuk
Thesis: *Narrowband Radar System for Indoor Doorway Detection*. **Submitted; in review**
CGPA: **4.67**/5.00

2009 – 2013 **University of Electronic Science and Technology of China, Chengdu, P.R.China.**
B.Eng. in wireless communications
Supervisor: Prof. Gang Wu & Prof. YONGLIANG GUAN
Thesis: *SC-FDMA Frequency Domain Oversampling MMSE Equalizer*.
GPA: **3.79**/4.00 or **88.5**/100 Ranking: **16**/110

Exchange Experience

July 2012 – **Research Assistant,**
May 2013 *supervised by Prof. YONGLIANG GUAN & Prof. Dmitriy Garmatyuk.*
Nanyang Technological University

July 2011 – **American Language Center Intensive English Communication Program.**
Aug 2011 University of California, Los Angeles

Research Experience

Mar 2014 – **Distributed MIMO Relaying for Range Extension and Diversity Enhancement,**
present *supervised by Prof. YONGLIANG GUAN.*
INFINITUS Lab, School of EEE, NTU

In the battlefield, the communications between two users (soldiers or vehicles) may fail due to the low received signal power (long distance signal attenuation or severe fading). In these cases, the relaying technique may help by decreasing the transmission distance (hence signal attenuation) and extracting multi-path diversity, in which other users in-between are chosen to be the relays. Therefore, we develop a real-time USRP-based relaying system.

- ◇ Compared the BER performance between CPM (GMSK) and SC-FDE by simulation. (collaborated with Dr. ZiLong LIU)
- ◇ Built up an USRP-based full-duplex relaying system using GMSK modulation in one path Rayleigh fading channel. (collaborated with Dr. NGUYEN Thanh Hieu)
- ◇ Built up an USRP-based transmission system based on SC-FDE in non-ideal wireless channel.

Oct 2012 – **Narrowband Radar System for Indoor Doorway Detection,**
 Jan 2015 *supervised by Prof. YONGLIANG GUAN & Prof. Dmitriy Garmatyuk.*

INFINITUS Lab, School of EEE, NTU & Department of Electrical and Computer Engineering, Miami University

Radar is an object-detection system that uses radio waves to determine the range and direction of objects. It could be employed on an Unmanned Ground Vehicle (UGV) for autonomous navigation. We propose a low-cost narrowband radar system based on USRP (Universal Software Radio Peripheral) hardware and C++/MATLAB programming to enable UGV autonomous indoor navigation. The main purpose is to investigate open doorway detection in an indoor environment utilizing a narrowband radar.

- ◇ Implemented, calibrated and verified the proposed USRP-based radar system.
- ◇ Collected the open doorway detection data in realistic indoor environment.
- ◇ Developed effective radar processing algorithms.
- ◇ Demonstrated the open doorway detection of radar-guided UGV.

July 2012 – **SC-FDMA Oversampling MMSE Equalizer,**
 June 2013 *supervised by Prof. YONGLIANG GUAN & Prof. Gang Wu.*

INFINITUS, School of EEE, NTU & National Key Laboratory of Science and Technology on Communications, UESTC

Single Carrier Frequency Division Multiple Access (SC-FDMA) is an alternative technique comparing with Orthogonal Frequency Division Multiple Access (OFDMA). However, it also suffers greatly from carrier frequency offset (CFO) due to the reason that CFO destroys the orthogonality among subcarriers. In order to improve the BER performance, we propose a novel frequency domain oversampling MMSE equalization receiver for SC-FDMA system.

- ◇ Designed an oversampling MMSE equalizer for SC-FDMA
- ◇ Compared the BER performance with the conventional MMSE equalizer.

Social Experience

Dec 2014 – **Committee Member.**
 present Intelligent Transport Society (ITS) Singapore Student Branch

June 2014 – **Committee Member.**
 present Graduate Student Council, NTU

Teaching

Spring 2012 TA, Introduction to Information Theory

Honors and Awards

2013 – 2014 **Master of Engineering Award.**
 SCHOOL OF EEE, NANYANG TECHNOLOGICAL UNIVERSITY

2009 – 2012 **Second-class People's Scholarship.**

Skills

Programming C/C++, MATLAB, Python

Typesetting \LaTeX

Language English, Chinese (native)

Publications

Publications

- [1] **YunXiang, Liu**, YongLiang Guan, Dmitriy Garmatyuk, and Jade Morton. USRP-based OFDM Radar Systems for Doorway Detection. In *Radar Conference*, pages 0875–0880. IEEE, 2014.
- [2] **YunXiang, Liu**, YongLiang Guan, Dmitriy Garmatyuk, and Francois Quitin. Improved Exit Path Identification with Indoor USRP-based Radar System. In *ION PNT 2015, Pacific Positioning, Navigation and Timing Meeting*, **to appear in 2015 ION PNT**.