Zhong Chen

PhD student of Electrical and Computer Engineering
Texas A&M University
3128 TAMU, College Station, TX77843
Tel. 979-229-9165
zhongchen@tamu.edu
https://www.zchenbio.com; https://github.com/zhongchen43

EDUCATION

Texas A&M University, College Station, Texas
Ph.D. in Electrical Engineering May 2020
M.S. in Electrical Engineering Aug 2015 – Aug 2017

Sichuan University, Chengdu, Sichuan, China
B.S. in Electrical Engineering (GPA: 3.89/4.0, Top 2) Sept 2009 – June 2013

RESEARCH EXPERIENCE AND PROFESSIONAL EXPERIENCE

Texas A&M University
Researcher (Nov 2015 – Present)

- Statistical Performance Analysis of Aperiodic Micro-UAV Swarm-Based (MUSB) Arrays
  - Derived and analyzed the Cramer-Rao bound for the deterministic error model with position errors
- Directional-of-arrival (DOA) Estimation with MUSB Arrays
  - Implemented robust Iterative-MUSIC algorithm for DOA estimation with MUSB arrays (3D random time-varying antenna arrays)
  - Build statistical model of MUSB arrays, investigated the DOA estimation performance in low noise low snapshot environment, derived the Cramer-Rao bound for the MUSB system, and estimate this system performance with Monte-Carlo simulations
- Impact of UAV Swarm Density and Heterogeneity on Synthetic Aperture DOA convergence
  - Developed a DOA finding system using volumetric random arrays, estimate sources with MUSIC, DOA estimation error within 4 degrees
- Tunable FM Band Tracking and Locating Cube Antenna System
  - Designed tunable monopole and loop electrically small antennas (FM band, antenna size: 100mm) to track and locate the FM signal

Sichuan University, Chengdu, Sichuan, China
*Team Leader (*2010 – 2012*)*

- 10th National Undergraduate Electronic Design Contest (China's largest electronic design contest)
  - Design system hardware circuits
- Undergraduate Students' Innovative Plan
  - Hardware system programming

COURSE PROJECTS

Texas A&M University
Graduate Student (Sept 2015 – Present)

- Imaging Classification with Deep Neural Network
  - Built deep neural networks to train 500 labelled images and judge if a picture from test dataset is a cat
- Imaging Classification with Convolutional Neural Network (CNN)
  - Created CNN in TensorFlow to train 500 labelled “hand sign” images and recognize the sign of picture)
- Autonomous Driving Application – Car Detection
  - Object detection using the powerful YOLO algorithm with Keras
- Neural Machine Translation (NMT)
  - Built the NMT model with attention mechanism to translate human readable dates into machine readable dates

TEACHING EXPERIENCE

Texas A&M University, College Station, TX Sept 2017 – Present
Teaching Assistant

- Laboratory for Industrial Automation (IDIS 400)
  - Teach the programmable logic controller (PLC) and its associated applications for IDIS 400 students
  - Teach 4 lab sections and 2 hours each lab for around 80 students weekly

WORK EXPERIENCE

TP-LINK, Shenzhen, China July 2013 – Apt 2015
RF Engineer

- AC2600 Wireless Dual Band Gigabit Router with multi-user MIMO (MU-MIMO) Technology
  - Designed dual-band (2.45 & 5.5 GHz) high gain high performance Wi-Fi (Size: 110mm* 7.4mm) to provide maximum omni-directional wireless coverage with beamforming technology
  - Tested the router system-level throughput in over-the-air (OTA) based on IEEE 802.11
- 450 Mbps Wireless Ceiling Access Point
  - Drafted PIFA antennas (2.45 GHz) to improve wireless coverage and lower the cost
- 300 Mbps Wireless Panel Access Point
  - Designed the DRAM circuits, RF circuits, IFA antenna, and antenna matching circuits
  - Test

PUBLICATIONS

Journal Publications

1. Z. Chen, S. Yeh, JF Chamberland, and GH Huff, "On the Cramer-Rao bound for directional-of-arrival estimation of unstructured time-varying 3-D antenna arrays," Manuscript.
2. Z. Chen, S. Yeh, JF Chamberland, and GH Huff, "Distributed directional finding system using micro-UAV swarm-based antenna arrays," in submission to Sensors.
3. Z. Chen, "DOA convergence of unstructured distributed arrays with time-varying and space-varying morphologies," Master's thesis,Texas A&M University, College Station, TX, USA, 2017.

Conference Publications

1. S.Yeh and Z. Chen, "Designing a broadband circularly polarized patch antenna array for millimeter-wave beamforming," 2019 AP-S Symposium and USNC-URSI Radio Science Meeting, Altanta Georgia, LA, USA, July. 7-12, 2019.
2. Z. Chen, JF Chamberland, and GH Huff, "Impact of UAV swarm density and heterogeneity on synthetic aperture DOA convergence," 2017 AP-S Symposium and USNC-URSI Radio Science Meeting, San Diego, CA, USA, July 9-14, 2017.

Patent

1. J. Tan and Z. Chen, "Dual-band WiFi omnidirectional antenna," application number: 201520257414.2, 2015.

LEADERSHIP

Electronic Science and Technology Association, Sichuan University July 2013 – Apr 2015
Chairman

- In charge of large-scale contest organizations, technical support to the whole college, technical trainings to the juniors to help students learn and design all kinds of electronic technology
- Manage a team of 50 people

TECHNICAL SKILLS

- 3 years of experience in numerical simulations, data modeling and analysis using MATLAB and python
- Familiar with C, C++, Java, TensorFlow, Keras
- Hands on experience with deep learning models.
- Familiar with Linux operating system
- Experience in front-end development (Maintain a personal website)
- Professional antenna and phased array design experience with HFSS
- RF system hardware design experience

TECHNICAL PROJECTS

- doa-library: A doa library for statistical performance analysis of MUSB arrays (3D random arrays)
  - Programmed the different arrays (ULA, UCA, MUSB arrays, etc.)
  - Implemented MUSIC (2D MUSIC, Iterative-MUSIC) algorithms for MUSB arrays
  - Implemented functions for CRB to analyze DOA estimation performance
- Medusa array system
  - Practical 3D random time-varying antenna arrays for DOA estimation applications

HONORS AND AWARDS

Texas A&M University

- **Scholarship and In-state Tuition Fee Award**, awarded to the top 5% students — Sept 2015 – May 2016

Sichuan University

- **Outstanding Graduates**, awarded to the top 2% students — March 2013
- **National Encouragement Scholarship**, awarded to the top 3% students — Sept 2011 – Oct 2012
- **Excellent Student Leader**, awarded to the top 2% students — Sept 2010 – Oct 2011
- **Excellent Volunteer**, awarded to the top 5% volunteers — Sept 2010 – Oct 2011
- **Comprehensive First-Class Scholarship**, awarded to the top 5% students — Sept 2009 – Dec 2010
- **National Scholarship** (highest scholarship in China), awarded to the top 2 students — Sept 2009 – Nov 2010