

## Zhongyuan Zhao, Ph.D.

Curriculum Vitae

Dept. of Electrical and Computer Engineering  
Rice University  
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### EDUCATION

- Ph.D. Department of Computer Science and Engineering, University of Nebraska-Lincoln, 2019  
Dissertation: *Improving Spectrum Efficiency by Exploiting User and Channel Behaviors for Next Generation Wireless Networks*
- M.Sc. Department of Electronic Engineering, University of Electronic Science and Technology of China, 2009
- B.Sc. Department of Electronic Engineering, University of Electronic Science and Technology of China, 2006

### PROFESSIONAL APPOINTMENT

- Dec. 2019- Postdoctoral Research Associate, Rice University
- 2013-2019 Research Assistant, University of Nebraska-Lincoln
- 2011-2013 Integration and Verification Engineer, Ericsson, Chengdu, China
- 2009-2011 Digital Signal Processing Software Engineer, ArrayComm, Chengdu, China

### PUBLICATIONS

#### Peer Reviewed Journal Articles

- 2021 **Zhongyuan Zhao**, Mehmet C. Vuran, Baofeng Zhou, Mohammad M.R. Lunar, Zahra Aref, David P. Young, Warren Humphrey, Steve Goddard, Garhan Attebury, and Blake France, "A City-Wide Experimental Testbed for The Next Generation Wireless Networks," *Ad Hoc Networks*, Vol. 111, pp102305, Feb.
- 2019 Demet Batur, Jennifer Ryan, **Zhongyuan Zhao**, and Mehmet C. Vuran, "Dynamic Pricing of Wireless Internet Based on Usage and Stochastically Changing Capacity," *Manufacturing and Service Operations Management*, Published Online, Feb.
- 2019 **Zhongyuan Zhao**, Mehmet C. Vuran, Demet Batur, and Eylem Ekici, "Shades of White: Impacts of Population Dynamics and TV Viewership on Available TV Spectrum," *IEEE Transactions on Vehicular Technology*, Vol. 68, No. 3, pp2427-2442, Jan.
- 2018 Samil Tamel, Mehmet C. Vuran, Mohammad M. R. Lunar, **Zhongyuan Zhao**, Abdul Salam, Ronald K. Faller, and Cody Stolle, "Vehicle-to-Barrier Communication

During Real-World Vehicle Crash Tests,” *Computer Communications*, Vol 127, pp. 172-186, Sep.

- 2007 Haihong Tang, **Zhongyuan Zhao**, “DSP and CPLD-based Digital AC Soft Starter,” *Automation Information*, (5), pp.53-55.

### Conference Proceedings & Demo

- 2021 **Zhongyuan Zhao**, Gunjan Verma, Chirag Rao, Ananthram Swami, and Santiago Segarra, “Distributed Scheduling using Graph Neural Networks,” Accepted by *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2021)*, online, Jun. 6-11, preprint arXiv: 2011.09430.
- 2019 **Zhongyuan Zhao**, Mehmet C. Vuran, Zahra Aref, David P. Young, Warren Humphrey, Steve Goddard, Garhan Attebury, Blake France, Baofeng Zhou, and Mohammad M. R. Lunar, ”A City-Wide Experimental Testbed for Next Generation Wireless Networks,” *IEEE Int. Balkan Conference on Communications and Networking (BalkanCom’19)*, Skopje, North Macedonia, Jun. 10-12.
- 2018 **Zhongyuan Zhao**, and Mehmet C. Vuran, “Modeling Aggregate Interference with Heterogeneous Secondary Users and Passive Primary Users for Dynamic Admission and Power Control in TV Spectrum,” *IEEE Int. Balkan Conference on Communications and Networking (BalkanCom’18)*, Podgorica, Montenegro, Jun. 6-8.
- 2017 D. Rempe, M. Snyder, A. Pracht, A. Schwarz, T. Nguyen, M. Vostrez, **Z. Zhao**, and M. C. Vuran, ”A Cognitive Radio TV Prototype For Effective TV Spectrum Sharing,” *IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN)*, pp. 117-118, Baltimore, MD, March 6-9.
- 2014 **Zhongyuan Zhao**, Mehmet C. Vuran, Demet Batur, Eylem Ekici, “Ratings for Spectrum: Impacts of TV Viewership on TV Whitespace,” *IEEE Global Communications Conference (GlobeCom’14)*, pp.941-947, Austin, TX, Dec. 8-12.
- 2009 Hongping Hu, **Zhongyuan Zhao**, “A Real-Time High Resolution Image Compression System Based on ADV212,” *2nd International Congress on Image and Signal Processing (CISP’09)*, pp.1-4, Tianjin, China, Oct.

### Manuscript in Submission

**Zhongyuan Zhao**, Mehmet C. Vuran, Fujuan Guo, and Stephen Scott, “Deep-Waveform: A Learned OFDM Receiver Based on Deep Complex Convolutional Networks,” Submitted to *IEEE Journal on Selected Areas in Communications*, (first revision) preprint arXiv: 1810.07181.

### Manuscript in Preparation

**Zhongyuan Zhao**, Gunjan Verma, Chirag Rao, Ananthram Swami, and Santiago Segarra, “Link Scheduling using Graph Neural Networks,” *IEEE Transactions on Wireless Communications*, in preparation.

### PATENTS

- 2016      **Zhongyuan Zhao**, Weixu Wang, Luping Pan, “PLL and Adaptive Compensation Method in PLL,” International Patent, [US9496881 B2](#), EP3047573 A4, CN105580278A, Issued Date: May.
- 2012      Zishu He, **Zhongyuan Zhao**, Jianzhong Zhang, Ting Chen, Kexin Jia, “Method and Apparatus for An Implementation of Polyphase Filter Structure,” China, [CN101958697B](#), Issued Date: Jul.

## AWARDS

- 2006-2009      National Scholarship, UESTC (China)
- 2006            Outstanding Graduate, UESTC

## CONFERENCE PARTICIPATION

### Demonstration & Poster

- 2017            D. Rempe, M. Snyder, A. Pracht, A. Schwarz, T. Nguyen, M. Vostrez, **Z. Zhao**, and M. C. Vuran, “A Cognitive Radio TV Prototype For Effective TV Spectrum Sharing,” IEEE International Symposium on Dynamic Spectrum Access Networks, pp. 117-118, Baltimore, MD, March 6-9.

### Papers

- 2014            **Zhongyuan Zhao**, Mehmet C. Vuran, Demet Batur, Eylem Ekici, “Ratings for Spectrum: Impacts of TV Viewership on TV Whitespace,” IEEE Global Communications Conference, pp.941-947, Austin, TX, December 8-12.

## RESEARCH EXPERIENCE

- 2019-Present      Autonomous Networking for Multi-domain Operations, Houston, Texas,  
Advisor: Santiago Segerra  
  
Develop advanced machine learning technologies for autonomous wireless networks to be robust and resilient against near-peer adversaries (sponsored by the Army Research Office).
- 2019-2019      Computational Biology for Drug Repurposing, Lincoln, Nebraska, Advisor: Thomas Helikar  
  
Develop Python software to analyze human genome microarray data and molecular interaction network to facilitate drug repurposing for gene-related diseases.
- 2017-2019      Cognitive Secure Cloud Radio Access Network for Efficient Spectrum Sharing, Lincoln, Nebraska, Advisor: Mehmet Can Vuran  
  
Build a city-wide cloud-radio access network testbed, and research in machine learning technologies for radio frequency signal processing and user classification.
- 2013-2017      Cog-TV: Business and Technical Analysis of Cognitive Radio TV Sets for Enhanced Spectrum Access, Lincoln, Nebraska, Advisor: Mehmet Can Vuran

Address various challenges in technology, network operation, business, and policy making for the next generation wireless networks to access the underutilized spectrum of legacy wireless systems in an efficient and cooperative manner.

- 2011-2013 Remote Radio Head in 4<sup>th</sup> Generation LTE Base-station (Ericsson), Chengdu, China  
Conduct various testing (radio performance, environmental, and certification) and develop in-house test automation software in the development of LTE base-station.
- 2009-2011 Digital Signal Processing in 4<sup>th</sup> Generation Cellular Base-station (ArrayComm), Chengdu, China  
Develop and optimize the air interface physical layer software of WiMAX and LTE base-stations on flagship multi-core digital signal processors.
- 2006-2009 Channelized Software Defined Radio Receiver, Chengdu, China  
Develop the intermediate frequency sub-system of a channelized multi-antenna software-defined radio receiver for electronic reconnaissance.

## TEACHING EXPERIENCE

### University of Nebraska-Lincoln, Graduate Teaching Assistant

Data Structure and Algorithms (fall 2017, spring 2019)

Multi-Agent System (fall 2017)

### University of Electronic Science and Technology of China, Teaching Assistant

Electronic Design Training Program (fall 2005 - summer 2007, 2-year program)

## PROFESSIONAL SERVICE

### Conference Activities

Technical Program Committee Member, *IEEE Vehicular Technology Conference 2020-Fall*

### Peer Reviewer

*IEEE Transactions on Wireless Communication*

*IEEE Transactions on Mobile Computing*

*IEEE Journal on Selected Areas in Communications*

*IEEE Communications Surveys and Tutorials*

*IEEE Transactions on Vehicular Technology*

*IEEE Transactions on Multimedia*

*The International Journal of Computer and Telecommunications Networking*

*Wireless Communications and Mobile Computing*

*IEEE InfoComm*

*IEEE ICC*

*IEEE GlobeCom*  
*IEEE DySPAN*  
*International Conference on Distributed Computing Systems*  
*IEEE Vehicular Technology Conference*

### **To Profession**

Secretary, Graduate Student Association, Department of Computer Science and Engineering, University of Nebraska-Lincoln, 2017-2018

### **PROFESSIONAL DESIGNATION**

Institute of Electrical and Electronics Engineers (IEEE), 2013-present  
Chartered Financial Analyst (CFA), Level III Candidate (May 2021)

### **PROFESSIONAL DEVELOPMENT/CERTIFICATIONS**

2018 Coursera 5-course specialization: Deep Learning, Specialization Certificate.  
2018 Coursera 5-course specialization: Foundations of Management, 3/5 Certificates.  
2017 Certificate of Completion, Institute for International Teaching Assistants, UNL.

### **LANGUAGES**

English: Advanced reading, writing, speaking  
Mandarin: Advanced reading, writing, speaking (native language)