Xue Wei

✉ xwei4@albany.edu   in xue-wei   🖥 homepage

EDUCATION

University at Albany, State University of New York   **NY, USA**
PhD, Signal Processing & Communications (Advised by: Dr.Dola Saha)   *01/2021 - present*
PhD, Computer Engineering (Advised by: Dr.Weifu Wang)   *09/2019 - 12/2020*
GPA: 3.89/4.0

Xidian University   **Shaanxi, China**
Master of Engineering, Signal and Information Processing   *09/2016 - 07/2019*
GPA: 3.78/4.0

Xidian University   **Shaanxi, China**
Bachelor of Engineering, Electrical and Computer Engineering   *09/2012 - 07/2016*
GPA: 3.67/4.0

Publications

My research focuses on wireless communications, wireless steganography, key generation, RFI cancellation with RIS. I have strong knowledge of OFDM, MIMO, WIFI, beamforming, RIS, Software Defined Radio, and Machine Learning techniques. I also have experience using Xilinx Zynq UltraScale+ RFSoC.

Journals

1. **Xue Wei**, Dola Saha, Gregory Hellbourg and Aveek Dutta, `IDOL:` Iterative Direction Of Arrival in Low SNR, IEEE Transactions on Cognitive Communications and Networking(Under Review).

2. **Xue Wei** and Dola Saha, `WISE:` Waveform Independent Signal Embedding for Covert Communication, IEEE Transactions on Machine Learning in Communications and Networking.

3. Jin Liu, **Xue Wei**, Langlang Li, MR Image Segmentation Based on Level Set Method, Multimedia Tools and Applications, 79, pages11487–11502(2020).

Conferences

1. **Xue Wei**, Randall Reese, Anna Quach, Nicholas Kaminski and Dola Saha, Exploiting Multi-Domain Features for Detection of Unclassified Electromagnetic Signals, in IEEE Military Communications Conference (MILCOM) 2024.

2. Zhibin Zou, **Xue Wei**, Xin Tian, Genshe Chen, Aveek Dutta, Khanh Pham, Erik Blasch, Joint Interference Cancellation with Imperfect CSI, in IEEE Military Communications Conference (MILCOM) 2024.

3. **Xue Wei**, Anushka Gupta, Aveek Dutta, Dola Saha and Gregory Hellbourg, RIS for Signal Cancellation in 3D, in IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN) 2024.

4. **Xue Wei** and Dola Saha, KNEW: Key Generation using NEural Networks from Wireless Channels, in N2Women Workshop ACM SIGCOMM 2023.

5. **Xue Wei**, Dola Saha, Gregory Hellbourg, Aveek Dutta, Multistage 2D DoA Estimation in Low SNR, in IEEE International Conference on Communications (ICC) 2023.

6. Zhibin Zou, **Xue Wei**, Dola Saha, Aveek Dutta, Gregory Hellbourg, SCISRS: Signal Cancellation using Intelligent Surfaces for Radio Astronomy Services, in 2022 IEEE Global Communications Conference (GLOBECOM).

7. **Xue Wei** and Dola Saha, KNEW: Key Generation using NEural Networks from Wireless Channels, in ACM Wireless Security and Machine Learning (WiseML) 2022.

8. Hesham Mohammed, **Xue Wei** and Dola Saha, Adversarial Learning for Hiding Wireless Signals, in 2021 IEEE Global Communications Conference (GLOBECOM).

9. Jin Liu, **Xue Wei**, Qi Li, Langlang Li, A Level Set Algorithm Based on Probabilistic Statistics for MR Image Segmentation, 2018 International Conference on Intelligence Science and Big Data Engineering, PP. 562.

10. Jin Liu, Langlang Li, Qi Li, **Xue Wei**, Collaborative Error Propagation for Single Sample Face Recognition, 2018 International Conference on Intelligence Science and Big Data Engineering, PP. 332.

Awards and Honors

MILCOM 2024 ComSoc Student Travel Grant	MILCOM2024
ACM SIGCOMM 2023 Student Travel Grant	SIGCOMM2023
ACM WiSec2022 Student Travel Grants	Wisec2022
Presidential Fellowship Award 2021	University at Albany
Presidential Fellowship Award 2020	University at Albany
Excellent Graduate Student	Xidian University
2017 First Class Graduate Student Scholarship	Xidian University

Research Experience

Intership in Intelligent Fusion Technology, Inc.   2024 May – 2024 August

- Build a GPS receiver to receive and process multiple GPS signals using USRP
- Design neural networks for canceling interference for time-varying MIMO channels

Open Set waveform Recognition   2023 – present

Advised by: Dr.Dola Saha. Cooperate with INL

- Generate Zigbee, Bluetooth, LTE, and WiFi data sets and provide wireless technical support
- Train Autoencoder and GAN neural networks to perform waveform recognition

NSF SWIFT: RFI cancellation using RIS   2022 – present

Advised by: Dr.Dola Saha and Dr.Aveek Dutta

- Propose 3D RFI cancellation by controlling the phase and amplitude to cancel incident RFI on telescope
- Provide blueprints and circuit analysis for RIS array prototyping across multiple DoAs
- Propose a three-stage algorithm that exploits digital beamforming, creates virtual subarrays, inspects multiple options and introduces clustering to estimate the DoA in low SNRs

Key generation   2022 – 2023

Advised by: Dr.Dola Saha

- Propose a Key Generation model using neural networks from wireless channels
- Extract the implicit features of channel in a compressed form to derive keys with high KGR and low KDR

Wireless steganography   2021 – 2023

Advised by: Dr.Dola Saha

- Design a complex-valued neural network, which is more powerful and has a faster learning speed than real-valued neural network, to hide the transmission of secret signals
- This method has nothing to do with any properties of the covert signal (waveform or modulation order)
- Transmit signals over the air and apply the transfer learning to retrain the model to further optimize the system and get a lower bit error rate

NSF Collaborative Research: Teaching human motion   2019 – 2020

Advised by: Dr.Weifu Wang

- Offer a systematic exploration of how to decompose complicated physical motions to make motion more interpretable and easier to learn for humans
- Build a teaching environment in a virtual environment (VR + unity)
- Use real robot teaching frontend to demonstrate motion clips(breaststroke, butterfly, etc)

Medical Image Segmentation and Face Recognition   2017 – 2019

Advised by: Dr.Jin Liu

- Propose an MR image segmentation algorithm based on the level set algorithm to address challenges present in medical images, such as uneven gray level distribution, strong background interference, and blurred target area
- Propose a cooperative representation model that integrates both global and local information to enhance the recognition accuracy of facial images under varying conditions in the context of single-sample face recognition

Teaching Experience

IECE 111-Introduction to ECE, IECE 141-Introduction to Programming	Spring 2022
IECE 553-Cyber-Physical Systems, IECE 110-Introduction to Engineering	Fall 2021
IECE 371-Signals and Systems, IECE 110-Introduction to Engineering	Fall 2020

TECHNICAL SKILLS

Languages: C, C++, MATLAB, Python, Julia
Expertise: Wireless Communications Systems, OFDM, Machine Learning, USRP X310, B210 etc
Platforms: PyTorch, Robot Operating System (ROS), HFSS, Xilinx Zynq UltraScale+ RFSoC, CASPER