# Xue Wei

xwei4@albany.edu xue-wei homepage No sponsorship required, Green Card application approved.

## 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

## TECHNICAL SKILLS

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

## 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**, Dola Saha and Anna Quach, 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.

## Research Experience

**AI Tutor - STEM Specialist in xAI** 2024 Dec – present

- Refine annotation tools and address complex problems from STEM fields to improve model performance, support and ensure the delivery of high-quality curated data during the training of new tasks

**Research intern in Intelligent Fusion Technology, Inc** 2024 May – 2024 Aug

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

**Research assistant in University at Albany, SUNY** 2019 Sep – present

**Mobile Emerging Systems and Applications (MESA) Lab** 2021 Jan – present

**Open Set waveform Recognition(Cooperate with INL)**

- Generate Zigbee, Bluetooth, LTE, and WiFi data sets and provide wireless technical support
- Extract features from autoencoders and design GAN to generate synthetic data and classify waveforms

**NSF SWIFT: RFI cancellation using RIS(Cooperate with Caltech)**

- 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**

- Train two NNs simultaneously to reconstruct each other's channel estimates and map each other's channel estimates to a latent space that is inaccessible to the adversary
- Extract the implicit features of channel in a compressed form to derive keys with high KGR and low KDR

**Wireless steganography**

- Design a complex-valued neural network to enable wireless steganography where the covert signal is encoded to resemble hardware generated noise
- 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

**Prof.Wang's lab** 2019 Sep - 2020 Dec

**NSF Collaborative Research: Teaching human motion(Cooperate with Dartmouth)**

- Explore how to decompose complex physical motion making it easier for humans to understand and learn
- Build a teaching environment in a virtual environment (VR + unity)
- Use real robot teaching frontend(ABB YuMi) to demonstrate motion clips(breaststroke, butterfly, etc)

**Research assistant in Xidian University** 2016 Sep - 2019 Jul

**Medical Image Segmentation and Face Recognition**

- 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

## 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