Haofeng Liu

(+44) 75790 12486 | liuhaofeng918@outlook.com | https://haofengliu.github.io/en/

Education

University of Manchester, UK | PhD candidate 2022.01—2025.12

Research interests: Wireless Communication, Signal Processing, Theoretical Analysis, Deep Learning, Integrated Sensing and Communication, Non-orthogonal Multiple Access. 获学院的博士科研讨论会第三名。

Publication:

- **H. Liu**, E. Alsusa and A. Al-Dweik, "Joint User-grouping and Power-allocation in Uplink NOMA-based ISAC Systems," *IEEE Wireless Commun. Lett.*, vol. 15, pp. 1345-1349, 2026.
- **H. Liu**, E. Alsusa, and A. Al-Dweik, "Performance Analysis of Pair-wise Symbol Detection in Uplink NOMA-ISaC Systems," in *IEEE Open J. Commun. Soc.*, vol. 6, pp. 3459-3479, April 2025.
- **H. Liu**, E. Alsusa and A. Al-Dweik, "Efficient Receiver Design for Uplink NOMA-based ISaC Systems with Interference Cancellation," *IEEE WCNC*, 2024.
- **H. Liu** and E. Alsusa, "A Novel ISaC Approach for Uplink NOMA System," in *IEEE Commun. Lett.*, vol. 27, no. 9, pp. 2333-2337, Sept. 2023.
- **H. Liu**, E. Alsusa and A. Al-Dweik, "UAV Tracking Using Channel-Anomaly-Based Deep Learning in ISAC Systems," *TechRxiv.* August 11, 2025. (*Submitted to IEEE Trans. Wireless Commun.*)
- **H. Liu**, E. Alsusa and A. Al-Dweik, et al. "A CSI-Anomaly-Based Approach to ISaC," *TechRxiv.* January 16, 2025. (*Submitted to IEEE Commun. Mag.*)

University College London, UK | Wireless and Optical Communication | Master 2020.09—2021.09

Graduated as Distinction, **GPA: 3.8/4**, Awarded excellent student representative

University of Leeds, UK | Eletrical and Communication Engineering | Bachelor 2018.09—2020.07

Graduated as First Class, **GPA: 3.7/4**, Awarded outstanding student scholarship

Project Experience

Target perception based on communication channel anomaly 2024.05—Present

- **Build an innovative system architecture to achieve radar target perception.** In view of the problem that traditional target detection relies on reflected signals and is prone to interfere with communication signals, a new radar target perception solution based on communication channel characteristics is proposed. Build an actual test platform, verify the feasibility of the system architecture through actual experiments, and combine machine learning technology to achieve real-time target detection.
- **Design deep neural networks to achieve target positioning and trajectory prediction.** Analyze and extract key features of communication channels in different scenarios, build and debug efficient neural network models, and achieve low-latency, high-precision target positioning and trajectory prediction.

Design and theoretical analysis of NOMA-based ISAC system 2022.08—2024.04

- **Build an innovative system architecture to eliminate mutual interference between radar and communication signals.** In order to solve the problem of mutual interference between radar and communication signals in an integrated system, a radar symbol inversion and a new constellation diagram design are proposed, and a processing strategy for every two consecutive signal cycles is adopted to effectively improve the communication bit error rate, data rate and radar channel estimation accuracy, which is significantly better than the traditional solution.
- **Carry out theoretical derivation and experimental verification.** Conduct closed-form derivation of key system performance indicators (including communication bit error rate, upper bound and interruption probability, etc.), and verify the performance under different influencing factors through experiments, providing a solid theoretical basis for system optimization.

Physical layer security based on known interference and deep learning 2021.01—2021.08

- **Design a precoding algorithm to reduce the risk of eavesdropping.** By analyzing the characteristics of the eavesdropper's received signal, an optimization scheme for precoding using known interference is proposed, which effectively reduces the probability of eavesdropping and improves the security of the physical layer.
- **Integrated deep learning acceleration algorithm.** Build a deep unfolding network, effectively combine traditional optimization algorithms with neural networks, greatly reduce computational complexity, and achieve fast and secure precoding.

Noise elimination and signal extraction of fetal heartbeat signal 2019.10—2020.05

- **Independently designed and deployed signal acquisition circuit.** Based on PIC16F877 microcontroller, independently completed PCB board design, assembly and testing to achieve real-time and efficient fetal heartbeat signal acquisition.
- **Develop efficient filtering and denoising algorithms.** Design and compare a variety of filtering algorithms to address the strong interference and noise in the collected signals, ultimately achieving accurate extraction of high signal-to-noise ratio signals while retaining key features.

Working Abilities

- **Research**: Familiar with the basic theories of wireless communications, familiar with mathematical tools such as matrix operations and linear algebra, and have solid experience in theoretical analysis and simulation of wireless communication systems; understand the principles of deep learning and its application in practice; familiar with convex optimization methods and basic theories of optical communications.
- **Programming**: Proficient in MATLAB and Python, and basic programming skills in C, C++, and HTML.
- **cooperation**: Served as the student representative of the college and the secretary of the IEEE ComSec Student Chapter, and has accumulated rich experience in communication, organization and coordination of activities.
- **Work**: Proficient in using Office and LaTeX and other tools, and capable of fluent reading, communication and writing in Chinese and English.
- **Others**: Familiar with embedded system development methods and theories, and have certain practical experience.