

# Chenrui Wu

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## EDUCATIONAL BACKGROUND

**The Chinese University of Hong Kong, Shenzhen, China** Sep. 2021 – Jun. 2023

Master of Philosophy in Computer and Information Engineering (MPhil. in CIE)

GPA: 3.64/4

**Harbin Institute of Technology, Weihai, China** Sep. 2017 – Jun. 2021

Bachelor of Engineering in Software Engineering (BEng. in SE)

GPA: 83/100

**Honor and Awards:**

Harbin Institute of Technology Second Grade Scholarship	2021
Contemporary Undergraduate Mathematical Contest in Modeling: 1 <sup>st</sup> Prize	2020
COMAP Mathematical Contest in Modeling: Finalist award	2020
Harbin Institute of Technology Subject Achiever Scholarship	2020
Harbin Institute of Technology Merit Student Award	2020
Harbin Institute of Technology English Language Contest Scholarship	2018
National English Contest for College Students: 2 <sup>nd</sup> Prize	2018

## PAPERS AND PUBLICATIONS

- **Chenrui Wu**, Zexi Li, Fangxin Wang, Chao Wu. *Learning Cautiously in Federated Learning with Noisy and Heterogeneous Clients*, IEEE ICME 2023, (CCF-B).
- **Chenrui Wu**, Yifei Zhu, Rongyu Zhang, Yun Chen, Fangxin Wang, Shuguang Cui. *FedAB: Truthful Federated Learning with Auction-based Combinatorial Multi-Armed Bandit*, IEEE IoT Journal, (JCR Q1, IF=10.23).
- **Chenrui Wu**, Yifei Zhu, Fangxin Wang. *DSFL: Decentralized Satellite Federated Learning for Energy-Aware LEO Constellation Computing*, IEEE Satellite 2022 (**Best Student Paper Award**).
- Rongyu Zhang\*, Yun Chen\*, **Chenrui Wu**, Fangxin Wang, Jiangchuan Liu. *Efficient Personalized Federated Learning for IoT Applications: Opportunities and Solutions*, IEEE Network, (JCR Q1, IF=10.29).
- Rongyu Zhang\*, Yun Chen\*, **Chenrui Wu**, Fangxin Wang. *Cluster-driven Federated GNN-based Recommendation System with Biased Message Dropout*, IEEE ICME 2023, (CCF-B).

## RESEARCH EXPERIENCE

**Intelligent Network and Multimedia Lab, CUHK(SZ)** Sep. 2021 – Jun. 2023

Supervisor: Professor Fangxin Wang

**Project: Data-driven future intelligent networking**

- Follow the supervisor Professor Wang Fangxin to conduct research on related topics in the field of computer networks. Focus on the topic of the federated learning.
- Incentive Mechanism of Federated Learning: Model the FL's incentive mechanism by auction theory. Use combinatorial multi-armed bandit to deal with the winner determination problem in the auction, which is equal to a client selection strategy for FL.

- Decentralized Satellite Federated Learning: Conduct decentralized federated learning in LEO satellite computing. Aggregate all gradients in each satellite, show advantage on synchronized FL, asynchronous FL and gossip averaging in satellite environment. Craft an energy-aware routing strategy.

**Computational Social Science Research Center, Zhejiang University**

Jun. 2022 – Nov.

2022

*Supervisor: Professor Chao Wu*

**Project: Federated learning with noise and class-imbalance data**

- Follow the supervisor Professor Chao Wu to conduct a summer research on federated learning.
- Noisy Labels in Federated Learning: Existing works detect noisy data by the small loss trick in centralized machine learning. But it does not work when local data is both small and class-imbalanced in FL. They also need a public dataset or other methods offending privacy. The work aims to handle the problem by prototype-based approaches with privacy preservation.

**Cyberspace Security Institute, Harbin Institute of Technology**

Sep. 2019 – Jun. 2021

*Supervisor: Professor Bailing Wang*

**Project: Analysis of Attack Mechanism and Attack Path of Measurement and Control System**

- Adopted various tools to test platform security, attack the platform, control the platform, and performed various tests. Conducted the vulnerability analysis of the host computer software and proposed improvement. Utilized multiple Linux virtual machines to reproduce vulnerabilities in various vulnerability libraries and tested some python scripts and reproduced vulnerabilities in the software. Wrote scripts for automatic testing of tools. Participated in the writing and publication of five articles regarding the project.

## PROFESSIONAL EXPERIENCE

**Hangzhou HikVision Digital Technology Co., Ltd**

Jun. 2020 – Sep.2020

Android Development Intern

- Individually responsible for the development of calls, settings, various message records (alarms, call and address book) and network management in the development of an access control video intercom and security alarm
- Utilized technologies including java programming, sound video transmission, face recognition

**Dalian Hi-Think Computer Technology Co., Ltd**

Jul. 2019 – Aug.2019

Application Developer Intern

- Participated in an application development of smart home system
- Responsible for part of the android program development

## SKILLS & SOFTWARE

- C/C++, Python, Java, JavaScript, SQL, HTML; Linux.
- Proficiency in writing and deploying code for machine learning and federated learning.