YANSONG HUANG

873994556@bupt.edu.cn · (+86) 180-175-85587 · https://iso497.github.io/

EDUCATION

Beijing University of Posts and Telecommunications (BUPT), Beijing, China 2022 – Present

Master student in Information and Communication Engineering, expected Jun. 2025
GPA (First Year): 91.65/100
Major Courses: Theory of Communication Network (90), Graph Theory and Applications (91)

Beijing University of Posts and Telecommunications (BUPT), Beijing, China 2018 – 2022

B.E. in Telecommunications Engineering with Management
GPA: 86.94/100
Major Courses: Principles of Communications (93), Internet Protocols (92)

Queen Mary University of London (QMUL), Beijing, China 2018 – 2022

Joint Programme with BUPT
B.S. with Honors, First Class in Telecommunications Engineering with Management
GPA: 86.94/100
Major Courses: Advanced Transform Methods (93), Interactive Media Design and Production (96)

PUBLICATIONS

Papers

Y. Huang, X. Li, M. Zhao, M. Peng, "Asynchronous Federated Learning via Over-the-Air Computation in LEO Satellite Networks," *IEEE Transactions on Wireless Communications*, Under Review.

- This paper proposed an asynchronous federated learning (FL) framework in low-earth orbit (LEO) satellite networks by exploiting multiple high-altitude platforms for model aggregation, where the advanced over-the-air computation (AirComp) transmission scheme is utilized for the sake of further reducing energy consumption.
- To find the optimal solution of global FL model aggregation scheme and beamforming vector, this paper proposed a quantity-quality jointed linkage search algorithm combining depth-first search (DFS) and breadth-first search (BFS) algorithm with subtree pruning.

Y. Huang, H. Wei, J. Yang, M. Wu, "Damaged Road Extraction Based on Simulated Post-Disaster Remote Sensing Images," *2021 IEEE International Geoscience and Remote Sensing Symposium IGARSS*, Brussels, Belgium, 2021, pp. 4684-4687.

- To enlarge the numbers of post-disaster remote sensing images for related deep learning tasks, this paper applied CoCosNet on translating pre-disaster images to simulated post-disaster images of the same area. The work was varified effective by the high accuracy of applying D-LinkNet trained with real post-disaster images on detecting damaged roads in simulated post-disaster images.

Patents

X. Li, **Y. Huang**, M. Zhao, "A User-Centric Federated Learning Method and Device Based on Visible Light Communication," Beijing: CN202310244213.8, June 23, 2023.
X. Li, **Y. Huang**, M. Zhao, "A Method, Device, System, and Virtual Node for Constructing a Digital Twin Network," Pending.

PROJECTS

Large-Scale Distributed Mobile Ad-hoc Network Emulation System Mar. 2022 – Present

This project constructed a communication **emulation** system deployed in a **distributed** framework and managed by Kubernetes. The system utilized Docker to create containers as independent nodes and emulated the effect of physical layer and data link layer through its highly flexible model plugin.

- Emulated Link 16 data link by TDMA model and calculated the BER-SINR curve in matlab as the input to the TDMA model as the judge of accepting a signal or not.

- Took the tracks of UAV swarm generated by path planning algorithms dynamically as input and emulated the communication of UAV swarm in the scenarios with obstacles.
- Deployed data compression and depression algorithm at the application layer to realize efficient data transmission in the emulation system.

Deep Learning Based Human State Assessment System Oct. 2021 – Present

This project construct a **non-contact human state assessment** system to monitor the realtime state of drivers and alert when abnormal state is predicted through videos captured by only one or two cameras. This system including target detection, keypoint detection, head pose estimation and time series prediction algorithms.

- Participated in the survey, design, implementation and testing of developing the system.

High-Resolution Road Disaster Monitoring and Assessment System Aug. 2020 – Jun. 2021

This project aimed to construct an **artificial intelligent** assisted system to monitor geological disasters and **assess road damage** through remote sensing images taken by satellites.

- Processed remote sensing images with ArcGIS API for Python.
- Surveyed on the deep learning algorithms for detecting damaged road in post-disaster remote sensing images.
- Implemented and validated the feasibility of damaged road detection algorithm D-LinkNet.
- Applied CoCosNet on generating simulated post-disaster remote sensing images.
- Published the paper "Damaged Road Extraction Based on Simulated Post-Disaster Remote Sensing Images" as the first author.

Intelligent Cloud Gallery Jun. 2020 – May 2021

This project created a **digital photo album** that demonstrated photos, artworks, and dynamic images to users based on current environmental conditions, date, and user preferences and **matched music to pictures**, providing users with a diverse artistic perspective. The voice assistant answered questions about artworks and enabled users to control the photo album in voice.

- Participated in requirements analysis, system design, implementation and testing of developing the product.
- Developed the digital photo album on Raspberry Pi.
- Developed the Android app that allowed users to control the digital photo album via their smartphones.

The Guidance of Music Influence on Music Evolution Feb. 2021

This project analyzed the **music influence**, revealed the characteristics of the music change and the musical evolution and revolution from **big data**.

- Developed a mathematical model to create a directed network of musical influence and analyzed related characteristics.
- Implemented the mathematical model by programming and wrote the paper.
- Was designated as Meritorious Winner in 2021 Interdisciplinary Contest In Modeling.

Skills

- Programming Languages: Python > Java > Matlab > C > C++ > HTML + CSS + JavaScript
- Platform: Linux
- Tools: LXC, Docker, Kubernetes

Honors and Awards

First-Class Scholarship, Twice — Oct. 2022, Oct. 2023
Outstanding Graduate, Award on Undergraduate Graduation Ceremony — Jun. 2022
QM Prize, Award on Undergraduate Graduation Ceremony — Jun. 2022
3rd Prize, Award on College Students Innovation and Entrepreneurship Forum — Jun. 2021
Meritorious Winner, Award on 2021 Interdisciplinary Contest In Modeling — Apr. 2021
Third-Class Scholarship, Twice — Oct. 2019, Oct. 2021