

Bingjie YAN

Federated Foundation Model · Trustworthy Federated Learning · Distributed Optimization · AI in Healthcare

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"Keep the curiosity."

EDUCATION

Institute of Computing Technology, Chinese Academy of Sciences (ICT, CAS & UCAS)

Beijing, China

Master of Engineering, Electronic and Information Engineering

2022.09 - Exp. 2025.06

- **GPA:** 3.79/4. **Supervisor:** Prof. Yiqiang CHEN and Prof. Xinlong JIANG
- **Research Topic:** Asynchronous Federated Learning, Multimodal Federated Foundation Model, FL in Medical & Healthcare.
- **Main Courses:** Pattern Recognition and Machine Learning (92), Intelligent Computing System (97), Practical Optimization Algorithm and Application (94), Algorithm Design and Analysis (96), Deep Learning (92), etc.
- **Awards:** Merit Student Awards (10%).

School of Computer Science and Technology, Hainan University (211)

Hainan, China

Bachelor of Engineering, Software Engineering for Big data (Big data courses are taught in English)

2018.09 - 2022.06

- **GPA:** 3.68/4 (89.65/100). **Ranking:** 10/181.
- **Main Courses:** Linear Algebra (97), Data Structure (99), Advanced Mathematics (90), C++ Programming (96), etc.
- **Awards:** The First Prize Scholarship (3%), Outstanding Graduate Awards (3%) and Merit Student Awards.

PUBLICATIONS

Note: Please check out Google Scholar for my full publication list. The total # citations exceeds 280, with an h-index of 4.

Under Review

- [1] [Bingjie Yan](#), Qian Chen, Yiqiang Chen[†], Xinlong Jiang[†], Wuliang Huang, Bingyu Wang, Zhirui Wang, Chenlong Gao and Teng Zhang. "Buffalo: Biomedical Vision-Language Understanding with Cross-Modal Prototype and Federated Foundation Model Collaboration". 33rd ACM International Conference on Information and Knowledge Management (CIKM'24, CCF-B, CORE-A). **Just Accepted.**
- [2] [Bingjie Yan](#), Danmin Cao, Xinlong Jiang, Yiqiang Chen[†], Weiwei Dai[†], Fan Dong, Wuliang Huang, Teng Zhang, Chenlong Gao, Qian Chen, Zhen Yan and Zhirui Wang. "FedEYE: A Scalable and Flexible End-to-end Federated Learning Platform for Ophthalmology". Patterns (Cell Press, JCR-Q1, IF=6.7). [\[PDF\]](#) [\[Code\]](#) [\[Page\]](#) [\[Site\]](#)
- [3] [Bingjie Yan](#), Xinlong Jiang[†], Yiqiang Chen[†], Chenlong Gao and Xuequn Liu. "AFL-CS: Asynchronous Federated Learning with Cosine Similarity-based Penalty Term and Aggregation". 29th IEEE International Conference on Parallel and Distributed Systems (CCF-C, CORE-B, **Oral**). [\[PDF\]](#) [\[Code\]](#)
- [4] [Bingjie Yan](#), Yiqiang Chen[†], Qian Chen, Xinlong Jiang, Yan Kang and Teng Zhang. "KAMOFL: K-Asynchronous Multi-objective Federated Learning with Privacy, Efficiency, and Utility Trade-offs". 39th Annual AAAI Conference on Artificial Intelligence (CCF-A, CORE-A*). **Manuscript.**
- [5] Qian Chen, Yiqiang Chen[†], [Bingjie Yan](#), Xinlong Jiang, Xiaojin Zhang, Yan Kang, Teng Zhang, Wuliang Huang, Chenlong Gao, Lixin Fan and Qiang Yang. "Model Trip: Enhancing Privacy and Fairness in Model Fusion across Multi-Federations for Trustworthy Global Healthcare". 40th IEEE International Conference on Data Engineering (CCF-A, CORE-A*, **Oral**). **Just Accepted.**
- [6] [Bingjie Yan](#), Jun Wang, Jieren Cheng[†], Yize Zhou, Yixian Zhang, Yifan Yang, Li Liu, Haojiang Zhao, Chunjuan Wang and Boyi Liu. "Experiments of Federated Learning for COVID-19 Chest X-ray Images". 7th International Conference on Artificial Intelligence and Security [\[PDF\]](#) [\[arXiv\]](#)
// Cited over 180 times on Google Scholar.
- [7] Zhiyi Zhang, Pengfei Zhang, Zhuopin Xu, [Bingjie Yan](#), Qi Wang[†]. "Im2col-Winograd: An Efficient and Flexible Fused-Winograd Convolution for NHWC Format on GPUs". 53rd International Conference on Parallel Processing (CCF-B, CORE-B). **Just Accepted.**
- [8] [Bingjie Yan](#), Boyi Liu[†], Lujia Wang, Yize Zhou, Zhixuan Liang, Ming Liu and Cheng-Zhong Xu. "FedCM: A Real-time Contribution Measurement Method for Participants in Federated Learning". 2021 International Joint Conference on Neural Networks (CCF-C, CORE-B, **Oral**). [\[arXiv\]](#) [\[PDF\]](#)
- [9] [Bingjie Yan](#), Jun Wang, Zhen Zhang, Xiangyan Tang[†], Yize Zhou, Guopeng Zheng, Qi Zou, Yao Lu, Boyi Liu, Wenxuan Tu and Neal Xiong. "An Improved Method for the Fitting and Prediction of the Number of COVID-19 Confirmed Cases Based on LSTM". Computers, Materials & Continua (CMC, JCR-Q3). [\[PDF\]](#)

RESEARCH EXPERIENCES

Summer Workshop on Trustworthy Federated Learning

Beijing, China

Host by WeBank & THUAIR, advised by Qiang YANG, Lixin FAN, and Yan KANG

2023.07 - 2023.12

- **FL Tuning.** Proposed a theoretical-guided K-Asynchronous Federated Learning Hyperparameters Tuning method, KAMOF, achieving better trade-offs between privacy, efficiency, and utility in KAFL with theoretical guarantees.
- **Model Fusion.** Developed ModelTrip, a method to merge models from different hospitals with fairness and privacy concerns without extra training. Achieved better performance and fairness compared to existing model fusion methods.

PROJECT EXPERIENCES

Federated Collaborative Platform and System for Digital Ophthalmology

Beijing, China

Core Member. Research Subject with Aier EYE Hospital (China's largest eye service provider)

2021.12 - 2024.06

- **Asynchronous FL.** Proposed an asynchronous federated aggregation method, AFL-CS, which considers both local and global gradient directions. Achieved faster and more stable convergence, making the platform more robust to highly heterogeneous environments.
- **Modal-Heterogeneous FL.** Explored EdgeAI solutions for ophthalmology to build a large-scale multi-modal model in modal heterogeneous scenarios via representation learning and modal alignment.
- **FedEYE Platform.** Designed a scalable and flexible federated learning platform for ophthalmologists with a user-friendly web interface. Deployed the platform in Aier EYE Hospital, attracting 50+ participating hospitals/institutes and launching 800+ federated tasks.

OPEN SOURCE CONTRIBUTIONS

FedML-AI Community (Research Intern & Contributor) 🔄 (★4k+)

2022.06 - 2022.09

- Enhanced FedCV with popular object detection models (e.g. YOLOv5, YOLOv7, YOLOv8, etc.), deployed them to production environment and provided technical support for the community.
- Ported the entire FLamby benchmark (7 real-world federated medical datasets) to FedML Open Platform.

hCaptcha-challenger (Maintainer) 🔄 (★1.3k+)

2021.12 - 2023.10

- Developed a robust AI-powered captcha solver utilizing Python and Selenium, effectively bypassing hCaptcha with an accuracy exceeding 90%, and provided a user-friendly API for developers.
- Utilized the CLIP model to achieve zero-shot captcha image classification and automatically labeled the captcha images via clustering. Leveraged the semantic alignment ability of CLIP to achieve open-set recognition.

Awesome-FL (Maintainer) 🔄 (★1.2k+)

2023.06 - present

- Actively contributed to the content, maintained the repository, and kept up with the latest research in FL.

Personal Projects 🔄

🔄 [beiyuouo](#) (150+ followers, 500+ stars)

- **arxiv-daily (★84):** Developed an automated system to collect and push the latest arXiv papers to GitHub using GitHub Actions.
- **awesome-asynchronous-federated-learning (★76):** Curated a collection of papers about asynchronous federated learning.
- **mid-air-draw (★17):** Implemented a simple hand-drawn and gesture recognition system using YOLOv5. [Demo]

SELECTED AWARDS

2017 Silver, (Intl.) 11th Asia and Pacific Informatics Olympiad, APIO

Beijing

2019 First Prize, (Natl.) The 3rd Silk Road Robotics Innovations Competition

Xi'an

2020 Second Prize, (Natl.) Contemporary Undergraduate Mathematical Contest in Modeling (CUMCM)

Beijing

2020 Second Prize, (Natl.) China Collegiate Computing Contest - Group Programming Ladder Tournament

China

2020 Second Prize, (Natl.) Chinese Collegiate Computing Competition

Beijing

2023 Sliver, (Natl.) China International College Students' "Internet+" Innovation and Entrepreneurship Competition

Beijing

2020 Third Prize, (Natl.) China Collegiate Computing Contest - Artificial Intelligence Innovation Contest

Hangzhou

2016 First Prize, (Prov.) National Olympiad in Informatics in Provinces, NOIP

Shandong

2020 First Prize, (Prov.) China Collegiate Computing Contest - Group Programming Ladder Tournament

Hainan

2020 Gold & Sliver, (Prov.) The 6th "Internet+" Innovation and Entrepreneurship Competition in Hainan

Hainan

2021 First Prize, (Prov.) Chinese Undergraduate Electronic Design Contest in Hainan

Hainan

2020 Second Prize, (Prov.) China Collegiate Computing Contest - Artificial Intelligence Innovation Contest

South China

SKILLS & INTERESTS

Language Chinese(Native), English(Fluent), CET-4: 539, CET-6: 478, IELTS: 6.0 (for now)

Programming Python (PyTorch, Tensorflow), C/C++, Java, JavaScript, HTML, etc.

AI/ML Federated AI (FedML, PySyft), Model (transformers, timm)

Software Engineering Git, Docker, Kubernetes, MPI4py, CI/CD, Hadoop, Spark, etc.

Photography Enjoy the life and capture the moments :)