Shaolong Chen

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EDUCATION

Imperial College London, United Kingdom 09/2025-09/2026(expected)

Master of Science in Applied Computational Science and Engineering

- Key courses: Computational Mathematics, Data Science and Machine Learning, Patterns for Parallel Programming

Beijing University of Posts and Telecommunications, China 09/2021-07/2025

Bachelor of Engineering in Computer Science and Technology

- Overall GPA: **3.68/4.0** Weighted Average Score: 88.32/100
- Key courses: Mathematic Analysis (I) (95), Data Structures (90), Python Programming (94), Design and Analysis of Algorithms (94), Machine Learning (88)
- Awards: The 2nd Class Academic Scholarship(2022), The 2nd Class Academic Scholarship(2023)

PUBLICATIONS

Chen, Shaolong, et al. "A Fairness-aware Incentive Framework for Heterogeneous Federated Learning with Bifurcated Reverse Auction Design." *2025 IEEE Wireless Communications and Networking Conference (WCNC)*. IEEE, 2025.

- Overview: Addressing challenges in heterogeneous federated learning systems, I contributed to developing Fairness-aware Clustered Federated Learning, a novel framework that harmonizes collective and individual fairness through a dual-layer reverse auction mechanism. This approach optimizes both global model accuracy and client participation equity under communication constraints.

RESEARCH EXPERIENCE

Cross-Domain Fusion Prototype System for Deep Learning Models Beijing, China

Research Assistant in State Key Laboratory of Networking and Switching Technology 02/2025-07/2025

- Developed a distributed training platform for cross-domain fusion scenarios, integrating **federated learning with large language models** (e.g., GPT2-XL, OPT-2.7B) to enhance performance in heterogeneous environments while ensuring robust privacy protection
- Designed optimization algorithms to address statistical and task heterogeneity, achieving 5% higher accuracy than FedAvg and FedProx baselines in multi-domain settings
- Implemented quantifiable privacy-preserving mechanisms, maintaining <5% accuracy loss across CNNs, RNNs, LSTMs, ViTs, and LLMs during distributed training

Trust-Aware Clustered Federated Learning Framework Based on Overlapping Community Detection Beijing, China

Supervised by Prof. Changqiao Xu 09/2024-01/2025

- Architected a trust-aware clustered federated learning framework that leverages overlapping community detection to enable users to belong to multiple communities, enhancing model personalization in heterogeneous social networks
- Engineered a trust propagation model integrating direct and indirect social trust to construct a similarity network, effectively isolating malicious users through low-trust filtering
- Devised a membership-based model aggregation and selection mechanism that optimizes client training efficiency while supporting personalized model adaptation across multiple community affiliations

Research on Big Data Interactive OLAP Multi-dimensional Business Data Beijing, China

Supervised by Associate Prof. Haihong E 03/2024-06/2024

- Designed and implemented an interactive OLAP multi-dimensional analysis framework, focusing on DOU (Data Usage per User) and MOU (Minutes of Use per User) trends across temporal, geographical, and customer segmentation dimensions to support data-driven decision-making for operators
- Innovated a dynamic customer stratification model by integrating monthly DOU/MOU fluctuations with regional performance metrics, enabling granular insights into user engagement patterns and optimizing resource allocation strategies through Hadoop-based data workflows and ring ratio analysis

SKILLS

Language: English(IELTS 6.5), Chinese (native), C, C++, Java, Python

Machine Learning Frameworks: Pytorch, TensorFlow, Transformers, LoRA

AI Security & Privacy: Federated Learning, Differential Privacy, Adversarial Attacks