**Dongqi Cai (蔡栋琪)**

PhD Student (Fourth Year)

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**Research Interests**

Federated Learning, Efficient NLP System, Speech Privacy.

**Education**

09/2024 – present **Visiting PhD**, University of Cambridge

* Advisor: Nicholas D. Lane

09/2021 – present **PhD in Computer Science and Technology**, BUPT

* Advisor: Shangguang Wang, Mengwei Xu
* Remote Advisor: Felix Xiaozhu Lin (University of Virginia)

09/2017 – 07/2021 **BS in Communication Engineering**, BUPT

* Advisor: Lin Fan

**Intership**

07/2021 – 12/2021 **Research Intern**, WeBank

* Mentor: Lixin Fan

**Honors & Awards**

* Scholar Award, NeurIPS, 2024
* CSC Scholarship, China Scholarship Council, 2024
* Travel Grant, EuroSys/MobiSys/ATC, 2024
* National Scholarship, Ministry of Education, 2023
* Outstanding Graduate Student, BUPT, 2023
* Excellent Ph.D. Students Foundation, BUPT, 2023
* Outstanding Graduate Student, State Key Laboratory of Networking and Switching Technology, 2022/2023
* First-class academic scholarship, BUPT, 2022
* National-Level, Innovation and Entrepreneurship Projects for College Students, 2019

**Academic Services**

* **TPC Member**

MobiSys’24 AE, MobiCom’24 AE, NCSC-edge'22, TURC-SIGBED-China'23

* **Reviewer**

Scientific Reports, TSC, TMC, TKDE, IoTJ, SAGC'22, ICASSP’24, ICASSP’25.

* **External Reviewer**

EIS'21, ICWS'23

**Conference Publications (\* = equal contributions; # = corresponding)**

(full list at <https://scholar.google.com/citations?user=dIimkboAAAAJ&hl=zh-CN>)

[C8] “SILENCE: Protecting privacy in offloaded speech understanding on wimpy devices”

**Dongqi Cai**, Shangguang Wang, Zeling Zhang, Felix Xiaozhu Lin, Mengwei Xu, in *the Annual Conference on Neural Information Processing Systems (****NeurIPS, CCF-A****),* 2024.

[C7] “FwdLLM: Efficient Federated Finetuning of Large Language Models with Perturbed Inferences”

Mengwei Xu (My advisor), **Dongqi Cai#**, Yaozong Wu, Xiang Li, Shangguang Wang, in *USENIX Annual Technical Conference* *(****USENIX ATC, CCF-A****),* 2024.

[C6] “Mobile Foundation Model as Firmware”

Jinliang Yuan\*, Chen Yang\*, **Dongqi Cai**\*, Shihe Wang, Xin Yuan, Zeling Zhang, Xiang Li, Dingge Zhang, Hanzi Mei, Xianqing Jia, Shangguang Wang, Mengwei Xu, in *Proc. ACM Int. Conf. Mobile Computing and Networking (****MobiCom, CCF-A****)*, 2024.

[C5] “Federated Few-shot Learning for Mobile NLP”

**Dongqi Cai**, Shangguang Wang, Yaozong Wu,Felix Xiaozhu Lin, Mengwei Xu, in *Proc. ACM Int. Conf. Mobile Computing and Networking (****MobiCom, CCF-A****)*, 2023.

[C4] “Efficient Federated Learning for Modern NLP”

**Dongqi Cai**, Yaozong Wu,Shangguang Wang, Felix Xiaozhu Lin, Mengwei Xu, in *Proc. ACM Int. Conf. Mobile Computing and Networking (****MobiCom, CCF-A****)*, 2023.

[C3] “GPT4D: Automatic Cross-Version Linux Driver Upgrade Toolkit”

Borui Yang, Hongyu Li, **Dongqi Cai**, in *the 8th EAI International Conference on Machine Learning and Intelligent Communications (MLICOM)*, 2023.

[C2] “FedAdapter: Efficient Federated Learning for Mobile NLP”

**Dongqi Cai**, Shangguang Wang, Yaozong Wu,Mengwei Xu, in *Proceedings of the ACM Turing Award Celebration Conference (TURC)*, 2023.

[C1] “Mitigating App Collusion using Machine Learning”

Xuefei Duan, Hua Lu, Jinliang Yuan, Qiyang Zhang, **Dongqi Cai**, in *IEEE 7th International Conference on Big Data Intelligence and Computing (DataCom)*, 2021.

**Journal Publications**

[J2] “Accelerating Vertical Federated Learning”

**Dongqi Cai**, Tao Fan, Yan Kang, Lixin Fan, Mengwei XU, Shangguang Wang, Qiang Yang, early access in *IEEE Transactions on Big Data (****IEEE TBD),*** 2022.

[J1] “Implementation of an E-payment security evaluation system based on quantum blind computing”

**Dongqi Cai,** Xi Chen, Yuhong Han, Xin Yi, Jinping Jia, Cong Cao, Ling Fan, in *International Journal of Theoretical Physics (IJTP),* 2020.

**Workshop Publications**

[W4] “Large Language Models on Mobile Devices: Measurements, Analysis, and Insights”

Xiang Li, Zhenyan Lu, Dongqi Cai, Xiao Ma, Mengwei Xu, in *Proceedings of the Workshop on Edge and Mobile Foundation Models (****EdgeFM****)*, *co-located with ACM International Conference on Mobile Systems, Applications, and Services (MobiSys, CCF-B),* 2024.

[W3] “FedRDMA: Communication-Efficient Cross-Silo Federated LLM via Chunked RDMA Transmission”

Zeling Zhang\*, **Dongqi Cai\***, Yiran Zhang, Mengwei Xu, Shangguang Wang, Ao Zhou, in *Proceedings of the 4rd Workshop on Machine Learning and Systems (****EuroMLSys****), co-located with European Conference on Computer Systems (EuroSys, CCF-A),* 2024.

[W2] “Towards Practical Few-shot Federated NLP”

**Dongqi Cai**, Yaozong Wu, Haitao Yuan, Shangguang Wang, Felix Xiaozhu Lin, Mengwei Xu, in *Proceedings of the 3rd Workshop on Machine Learning and Systems (****EuroMLSys****), co-located with European Conference on Computer Systems (EuroSys, CCF-A),* 2023.

[W1] “Towards ubiquitous learning: A first measurement of on-device training performance”

**Dongqi Cai**, Qipeng Wang, Yuanqiang Liu, Yunxin Liu, Shangguang Wang, Mengwei Xu, in *Proceedings of the 5th International Workshop on Embedded and Mobile Deep Learning* (***EMDL***), *co-located with ACM International Conference on Mobile Systems, Applications, and Services (MobiSys, CCF-B),* 2021.

**Patents**

[P4] "A Federated Learning Method, System, and Apparatus Based on Forward Gradient"

Mengwei Xu; Yaozong Wu; **Dongqi Cai;** Shangguang Wang

[P3] "A Federated Few-Shot Learning Method, System, and Device for Natural Language Models"

Mengwei Xu; **Dongqi Cai**; Ao Zhou; Xiao Ma; Shangguang Wang

[P2] "A Federated Learning Method, Device, and System for Pre-trained Models"

Mengwei Xu; **Dongqi Cai**; Ao Zhou; Xiao Ma; Shangguang Wang,

[P1] "Vertical Federated Learning Modeling Optimization Method, Device, Medium, and Program”

**Dongqi Cai**; Lixin Fan; Qiang Yang

**Teaching Experience**

* Teaching Assistant, Principles of Machine Learning Systems, Cambridge (Autumn 2024)

**Invited Talk**

* EMDL’21 (Co-located with MobiSys’21), Towards ubiquitous learning: A first measurement of on-device training performance, Online, 2021/06/25
* EuroMLSys’23 (Co-located with EuroSys’23), Towards Practical Few-shot Federated NLP Rome, Italy, 2023/05/08
* MobiCom’23, Efficient Federated Learning for Modern NLP, Madrid, Spain, 2023/10/05
* MobiCom’23, Federated Few-shot Learning for Mobile NLP, 2023/10/05, Madrid, Spain
* BUPT ‘Diligent Research, Academic Leadership’ Academic Forum, Efficient Federated Learning for Modern NLP, Beijing, China, 2023/12/26
* EuroMLSys’24 (Co-located with EuroSys’24), FedRDMA: Communication-Efficient Cross-Silo Federated LLM via Chunked RDMA Transmission, Athens, Greece, 2024/04/22
* MoiSys’24 N2Women, Large Language Models on Mobile Devices: Measurements, Analysis, and Insights, Tokyo, Japan, 2024/06/03
* EdgeFM’24 (Co-located with MobiSys’24), Large Language Models on Mobile Devices: Measurements, Analysis, and Insights, Tokyo, Japan, 2024/06/07
* USENIX ATC’24, FwdLLM: Efficient Federated Finetuning of Large Language Models with Perturbed Inferences, SANTA CLARA, CA, USA, 2024/07/11