

# TIANQU KANG

The University of Texas at Austin, Austin, TX, USA

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## EDUCATION

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**The University of Texas at Austin**, Austin, TX, USA Sept. 2025 – Present  
*Ph.D. in Electrical and Computer Engineering, Supervisor: Prof. [Gustavo de Veciana](#)*

- Research focus: Large language model (LLM) inference and networked system design for efficient and distributed AI computation

**Hong Kong University of Science and Technology**, Hong Kong Sept. 2023 - July 2025  
*MPhil in Electronic and Computer Engineering, Supervisor: Prof. [Khaled B. Letaief](#)*

- Current GPA: 4.00/4.30

**Hong Kong University of Science and Technology**, Hong Kong Sept. 2019 - June 2023  
*BEng in Electronic Engineering & Mathematics, Advisor: Prof. [Kevin CHAU](#)*

- GPA: 4.04/4.30, ranked 3/102, graduated with First Class Honors and Academic Achievement Medal

**École Polytechnique Fédérale de Lausanne**, Switzerland Feb. 2022 - July 2022  
*One-semester exchange in the section of Mathematics*

- GPA: 5.69/6.00. Participated in a [research semester project](#) named *Automatic vectorization and quantitative analysis of XIXth century maps of Paris* in Digital Humanities Laboratory (DHLAB) [[Github](#)]

## PUBLICATIONS AND PREPRINTS

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- [1] **T. Kang**, Z. Wang, H. He, J. Zhang, S. Song and K. B. Letaief, “Federated Low-Rank Adaptation with Differential Privacy over Wireless Networks,” in *Proc. IEEE Int. Mediterranean Conf. Commun. Netw. (MeditCom)*, Nice, France, 2025. [[Paper](#)]
- [2] **T. Kang**, L. Liu, H. He, J. Zhang, S. Song and K. B. Letaief, “The Effect of Quantization in Federated Learning: A Rényi Differential Privacy Perspective,” in *Proc. IEEE Int. Mediterranean Conf. Commun. Netw. (MeditCom)*, Madrid, Spain, 2024. [[Paper](#)]
- [3] **T. Kang**, A.-D. Dinh, B. Wang, T. Du, Y. Chen, and K. Chau. “Optimization of a Real-Time Wavelet-Based Algorithm for Improving Speech Intelligibility,” *arXiv:2202.02545*, Jul. 21, 2022. [[Paper](#)]
- [4] K. L. Wong, J. Wei Chin, T. T. Chan, I. Odinaev, K. Suhartono, **K. Tianqu**, and R. H. Y. So, “Optimising rPPG signal extraction by exploiting facial surface orientation,” In *2022 IEEE/CVF Conf. Comput. Vis. Pattern Recog. Workshops (CVPRW)*, Jun. 2022, pp. 2164–2170. [[Paper](#)]
- [5] Y. Chen, **T. Kang**, J. Zheng, Y. Wan, K. Y. H. Sim, E. Chau, and K. Chau, “A real-time wavelet-based algorithm for improving speech intelligibility,” in *Proc. Meet. Acoust. (POMA)*, vol. 42, no. 1, p. 060009, Dec. 2020 [[Paper](#)]

## RESEARCH PROJECTS

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**Federated Finetuning with Differential Privacy Guarantees** [[1](#)] Apr. 2024 – Present  
*Research Assistant, collaborating with Prof. [Khaled B. Letaief](#) & Dr. [Zixin Wang](#)* HKUST

- Designed a privacy-preserving split federated fine-tuning framework for large-scale AI models in wireless networks, leveraging differential privacy (DP) and low-rank adaptation (LoRA)
- Addressed noise amplification challenges in cascaded LoRA architectures by updating one low-rank matrix while fixing the other as a scaled orthonormal matrix, achieving superior utility under strict privacy constraints compared to baseline methods

**Effects of Quantization in Federated Learning [2]** July 2023 – Apr. 2024  
*Research Assistant, collaborating with Prof. Khaled B. Letaief & Dr. Lumin Liu* HKUST

- Explored the relationship between quantization and privacy in federated learning systems
- Employed Rényi Differential Privacy to derive privacy budgets for quantized Gaussian mechanisms
- Demonstrated that quantization mitigates privacy leakage through Membership Inference Attack, validating the theoretical insights

**Edge AI for 6G Wireless Communications** Aug. 2022 – May 2023  
*Final Year Thesis, supervised by Prof. Khaled B. Letaief & Dr. Lumin Liu* HKUST

- Conducted a comprehensive survey on edge learning, edge inference, and optimization algorithms for network resource allocation in future wireless networks

**Semester Projects of DHLAB** Feb. 2022 – June 2022  
*Supervised by Prof. Frédéric Kaplan and Mr. Rémi Petitpierre* EPFL

- Developed an algorithm to automatically align historical maps of Paris, which can perfectly align vectorized maps 50% of the time. The algorithm was reused in the context of a master thesis of EPFL in late 2022

**Projects in Audio Signal Processing [3][5]** Sept. 2020 – Sept. 2022  
*Undergraduate Research Opportunities Program, supervised by Prof. Kevin CHAU* HKUST

- Enhanced a wavelet-based algorithm for speech processing, improving intelligibility under diverse noisy environments and simulated hearing loss conditions
- Developed an innovative method for adjusting sub-band gains of discrete-time speech signals without altering the overall energy of the signal

## PROFESSIONAL EXPERIENCE

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**PanopticAI**, startup at Hong Kong Dec. 2021 - Feb. 2022  
*Research Assistant*

- Investigated research that uses remote photoplethysmography (rPPG) to measure vital human signs by detecting subtle skin color changes through a camera
- Generalized the code and further tested the performance of our algorithm on different datasets [4]

## TEACHING AND MENTORING

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**Teaching Assistant, HKUST** Spring 2024

- ELEC 1200 Signals and Systems: Delivered one tutorial and seven lab sessions to a class of 70 students

**Peer Counselor Training Program, HKUST** Spring 2021

- Undertook training on mental health and helped in events organized by the Counselling Center, including *Special Educational Needs Festival* and *Be a Star Exhibition*

## HONORS AND AWARDS

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Postgraduate Studentship (PGS)	2023
<a href="#">Academic Achievement Medal</a> (about the top 1% of the graduates)	2023
Finalist of <a href="#">Mr Armin And Mrs Lillian Kitchell Undergraduate Research Award</a>	2022
<a href="#">HKSAR Government Scholarship Fund - Reaching Out Award</a>	2022
<a href="#">University's Scholarship Scheme for Continuing Undergraduate Students</a> (top 2% of all UG)	2021 - 2022
<a href="#">HKSAR Government Scholarship Fund - Talent Development Scholarship</a>	2021
HKUST School of Engineering Dean's List	2019 - 2023