

TIANQU KANG 康天衢

kangtianqu@gmail.com \diamond tkang@utexas.edu \diamond kangtianqu@163.com

No 74 Jianan East Road ,Anning, Lanzhou, Gansu, China

86 13669354342 \diamond 1 737 328 4536

PERSONAL INFORMATION

Gender: Male **Date of birth:** December 10 2000

Place of birth: Lanzhou city, Gansu province, China

EDUCATION AND RESEARCH EXPERIENCE

The University of Texas at Austin, Austin, TX, USA Sept. 2025 –Present

Ph.D. in Electrical and Computer Engineering, Supervisor: Prof. [Gustavo de Veciana](#)

- GPA: 4.00/4.00; research focus: optimization, theoretical analysis, uncertainty quantification, and networked system design

Cascaded Conformal Prediction Sept. 2025 –Present

Research Assistant, collaborating with Prof. [Gustavo de Veciana](#)

UT Austin

- Studying mathematical methods for uncertainty quantification, with an emphasis on optimizing prediction efficiency under reliability and computational constraints
- Developed a two-stage analytical framework to improve the tradeoff between computational cost and prediction-set size
- Conducted theoretical analysis of the proposed framework, including information-theoretic characterization and threshold-based performance analysis

Hong Kong University of Science and Technology, Hong Kong Sept. 2023 - July 2025

MPhil in Electronic and Computer Engineering, Supervisor: Prof. [Khaled B. Letaief](#)

- GPA: 4.00/4.30; research focus: wireless communications, distributed optimization, and privacy-aware system design

Distributed Optimization with Privacy Guarantees [1] Apr. 2024 –June 2025

Research Assistant, collaborating with Prof. [Khaled B. Letaief](#) & Dr. [Zixin Wang](#) HKUST

- Studied privacy-aware distributed optimization methods for communication-constrained networked systems
- Designed an efficient parameter-update strategy to improve the balance between system performance, communication efficiency, and formal privacy guarantees
- Analyzed the impact of structural constraints on optimization performance and validated the proposed approach through numerical studies

Optimization for Reconfigurable Beamforming Networks [2] Sept. 2024 – Dec. 2024

Course project with [Jichen Zhang](#)

HKUST

- Isolated and formulated the beamforming-current optimization problem for fluid antenna system design
- Developed the projected-gradient optimization algorithm used to approximate the target Bessel correlation structure
- Derived the complex-domain gradient using Wirtinger/CR-calculus and implemented the column-normalized projection step

Effects of Quantization in Distributed Learning Systems [3] July 2023 –Apr. 2024
Research Assistant, collaborating with Prof. Khaled B. Letaief & Dr. Lumin Liu HKUST

- Investigated the theoretical relationship between quantization, communication efficiency, and privacy guarantees in distributed systems
- Applied Rényi Differential Privacy to characterize privacy budgets under quantized Gaussian mechanisms
- Performed numerical evaluations to support the theoretical findings and assess practical system tradeoffs

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

Projects in Audio Signal Processing [4][6] Sept. 2020 –Sept. 2022
Undergraduate Research Opportunities Program, supervised by Prof. Kevin CHAU HKUST

- Worked on optimization-based methods for discrete-time audio signal processing
- Improved a wavelet-based speech processing algorithm for noisy environments and simulated hearing-loss conditions
- Developed a method for adjusting sub-band gains while preserving the overall signal energy

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

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

- Developed an algorithmic method for aligning historical maps of Paris
- The project involved geometric processing, computational analysis, and evaluation on digitized map data

PUBLICATIONS AND PREPRINTS

- [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]

Studied efficient distributed optimization methods over wireless networks, with an emphasis on communication efficiency, system performance, and formal privacy guarantees.

- [2] J. Zhang, J. Rao, **T. Kang**, Z. Ming, Y. Chen, A. Umirbayev, C.-Y. Chiu, and R. Murch, “Scalable Pixel-based Reconfigurable Beamforming Networks for Designing Fluid Antenna Systems,” *arXiv:2512.03703*, Dec. 3, 2025. [Paper]

Developed a scalable beamforming network design for reconfigurable antenna systems, focusing on efficient signal control, flexible system configuration, and practical wireless communication applications.

- [3] **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]

Analyzed the theoretical relationship between quantization, communication efficiency, and privacy guarantees in distributed optimization systems.

- [4] **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]

Developed and evaluated an optimization-based real-time signal-processing method for improving speech intelligibility under challenging listening conditions.

- [5] K. L. Wong, J. Wei Chin, T. T. Chan, I. Oдинаev, 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]

Investigated a signal extraction method for contactless visual sensing, with emphasis on geometric factors, measurement reliability, and practical evaluation.

- [6] 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]

Designed a real-time wavelet-based signal-processing method for enhancing speech clarity, with evaluation under noisy and impaired listening conditions.

PROFESSIONAL EXPERIENCE

PanopticAI, Hong Kong
Research Assistant

Dec. 2021 – Jan. 2022

PanopticAI is a Hong Kong-based technology company developing contactless sensing and signal-processing solutions for health-related applications.

- Conducted regular literature reviews on contactless sensing, signal processing, and measurement methodologies, and summarized key findings for the research team
- Assisted in developing and refining computational methods for extracting useful information from visual signal data
- Evaluated algorithmic performance across multiple datasets to assess robustness, reliability, and practical limitations
- Supported the preparation of a research manuscript on the effect of facial surface orientation in non-contact signal extraction [5]
- Contributed to testing and improving signal extraction procedures for real-world sensing applications

HONORS AND AWARDS

Postgraduate Studentship (PGS)	2023
Academic Achievement Medal (about the top 1% of the graduates)	2023
Finalist of Mr Armin And Mrs Lillian Kitchell Undergraduate Research Award	2022
HKSAR Government Scholarship Fund - Reaching Out Award	2022
University’s Scholarship Scheme for Continuing Undergraduate Students	2021 - 2022
HKSAR Government Scholarship Fund - Talent Development Scholarship	2021
HKUST School of Engineering Dean’s List	2019 - 2023