

# Te-Yi “Dexter” Kan

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## Research Areas

Privacy-Preserving ML, Neural Architecture Search (NAS), Lightweight & Efficient ML, Edge Computing & Task Scheduling, Computer Vision, Large Language Models (LLMs), Wireless Networking & Communications.

## Technical Skills

**Programming Languages:** Python, C/C++, Java, Bash, Matlab, R  
**Frameworks & Libraries:** Pandas, PyTorch, TensorFlow, Transformers, OpenStack, Docker, Kubernetes

## Education

- University of Southern California** - *Ph.D. in ECE* Aug. 2022 - May 2027 (expected)  
• Dissertation Topic: Towards Efficient and Privacy-Preserving Machine Learning for Resource-Constrained Devices  
• Coursework: Stochastic Network Optimization, Operating Systems, Computer Vision, Artificial Intelligence, Reinforcement Learning & Large Language Models
- University of California, Los Angeles** - *M.S. in ECE* Sep. 2019 - Dec. 2020  
• Coursework: Convex Optimization, Neural Networks and Deep Learning, Reinforcement Learning
- National Taiwan University** - *B.S. in EE* Sep. 2014 - Jan. 2019  
• Coursework: Wireless and Mobile Networking, Wireless Communications, Network Planning and Management

## Selective Publications

- [1] **Te-Yi Kan**, Konstantinos Psounis, “Low-Latency Private ML inference for Vision Tasks in Distributed Environments”, *IEEE Transactions on Dependable and Secure Computing*, 2025, submitted. (TDSC-25)
- [2] **Te-Yi Kan**, Konstantinos Psounis, “Online distributed offloading of time-sensitive vehicular tasks in edge-cloud systems”, *IEEE Transactions on Vehicular Technology*, 2025. (TVT-25) | 📄
- [3] **Te-Yi Kan**, Ronald Y. Chang, Feng-Tsun Chien, “Hybrid Intelligent Reflecting Surface and Classical Relay Assisted Multiuser MISO Systems”, *IEEE Transactions on Vehicular Technology*, 2023. (TVT-23) | 📄
- [4] Tz-Wei Mo, Ronald Y. Chang, **Te-Yi Kan**, “DeepMCTS: Deep Reinforcement Learning Assisted Monte Carlo Tree Search for MIMO Detection”, *2022 IEEE 95th Vehicular Technology Conference: (VTC2022-Spring)*, 2022. (VTC-22) | 📄
- [5] **Te-Yi Kan**, Ronald Y. Chang, Feng-Tsun Chien, “Intelligent Reflecting Surfaces and Classical Relays: Coexistence and Co-Design”, *2021 IEEE GlobeCom Workshops (GC Wkshps)*, 2021.(GC-21). | 📄
- [6] **Te-Yi Kan**, Yao Chiang, Hung-Yu Wei, “QoS-aware Mobile Edge Computing System: Multi-server Multi-user Scenario”, *2018 IEEE GlobeCom Workshops (GC Wkshps)*, 2018. (GC-18) | 📄
- [7] **Te-Yi Kan**, Yao Chiang, Hung-Yu Wei, “QoS-aware Fog Computing System: Load Distribution and Task Offloading”, *The 15th IEEE Vehicular Technology Society Asia Pacific Wireless Communications Symposium (VTS APWCS)*, 2018. (APWCS-2018) | 📄
- [8] **Te-Yi Kan**, Yao Chiang, Hung-Yu Wei, “Task Offloading and Resource Allocation in Mobile-Edge Computing System”, *2018 27th Wireless and Optical Communication Conference (WOCC)*, 2018. (WOCC-18) | 📄

## Research Projects

- Efficient Hardware-aware Neural Architecture Search for Mobile Devices [ICML-26]** Jun. 2025 - Present  
• Designed a two-stage NAS framework combining cloud-based search with edge-based fine-tuning, enabling high-performance personalized models under strict latency and memory constraints.  
• Conducted extensive experiments on CIFAR-100, ImageNet, and Freiburg datasets, with cross-dataset comparisons to evaluate effectiveness under varying edge-cloud distribution shifts.
- Privacy-Preserving ML Systems [TDSC-25]** Jun. 2024 - Present  
• Built a privacy-preserving inference pipeline with sensitive object detection, task scheduling, and obfuscation modules for vision tasks.

- Leveraged distributed remote servers to balance utility and privacy.
- Achieved ~30% higher task utility at 25 fps without compromising user privacy.

#### **Online Distributed Offloading Mechanism in Vehicular Networks [TVT-24]**

Feb. 2023 - May 2024

- Developed TODORA, a threshold-based online distributed offloading and resource allocation mechanism for real-time vehicular ML tasks.
- Reduced end-to-end task duration (execution delay + communication overhead) by optimizing offloading and allocation under dynamic edge-cloud environments.
- Demonstrated superior performance over state-of-the-art baselines via extensive simulations.

#### **Intelligent Reflecting Surface (IRS) [TVT-23, GC-21]**

Jan. 2021 - May 2022

- Proposed a multiuser downlink MISO system assisted by a full-duplex IRS and half-duplex DF relay.
- Designed an alternating-optimization algorithm to jointly optimize active BS/relay beamforming and IRS passive beamforming for maximum sum-rate.
- Demonstrated significant throughput gains and analyzed tradeoffs in joint beamforming design.

#### **Multiple-input multiple-output (MIMO) Detection [VTC-22]**

Oct. 2020 - Apr. 2021

- Devised a deep reinforcement learning enhanced Monte Carlo Tree Search (MCTS) framework for MIMO detection.
- Demonstrated notable performance and complexity improvements over conventional MCTS across diverse channel conditions.

#### **Multi-access Edge Computing (MEC) Systems [GC-18, APWCS-18, WOCC-18]**

Sep. 2017 - Aug. 2018

- Developed QoS-aware task offloading strategies for MEC systems in single- and multi-server settings.
- Proposed a two-stage algorithm optimizing task offloading, resource allocation, and load distribution.
- Validated superior latency reduction and QoS performance against multiple benchmarks.

## **Work Experience**

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#### **Member, Academia Sinica-MediaTek Collaborative Project**

Oct. 2021 - May 2022

- Designed an AI-enabled hybrid RIS/relay system to improve energy efficiency and system sum-rate.
- Analyzed system performance and tradeoffs in mmWave and THz frequency bands.

#### **Summer Intern, Foxconn Technology Group**

Jun. 2017 - Aug. 2017

- Implemented a commercial MEC infrastructure to enable lifecycle management of MEC services.
- Contributed to the development of an MEC-powered face recognition system for access control and attendance management, using OpenStack for deployment.

## **Selective Course Projects**

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#### **Schematic-to-Netlist Translation using RL-Enhanced VLM Pipeline**

Fall 2025

- Developed an RL-enhanced VLM pipeline to translate circuit schematic diagrams into SPICE-compatible netlists.
- Leveraged LLaMA to generate initial netlist candidates and applied RL techniques with syntax and functional correctness as reward signals to iteratively refine translation quality.

#### **Generative Adversarial Imitation Learning (GAIL)**

Spring 2020

- Implemented a scalable imitation learning algorithm in Python for high-dimensional environments.
- Achieved superior performance over Behavior Cloning on OpenAI Gym tasks (Pendulum, Cartpole).

#### **Image Generation Methods for Cataract Surgery**

Winter 2020

- Applied U-Net and U-Net+WGAN frameworks to segment cataract surgery images of eye structures.
- Benchmarked models using pixel accuracy, mean IoU, and F1 score, with comparisons against self-labeled data.

#### **IEEE 802.15.4 Design Challenge**

Fall 2017

- Designed duty cycle-adaptive Machine-to-Machine (M2M) communication protocols for wireless networks.
- Implemented protocols on FCM2401 modules using AutoNet SDK.

#### **Functionally Reduced And-Inverter Graph (FRAIG)**

Fall 2016

- Built a C-based FRAIG circuit representation with data structures for detecting functionally equivalent pairs.
- Integrated hashing, Boolean simulations, and SAT solvers to identify equivalences in digital circuits.