Zexin Li

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Research Interests

My research interests lie in interdisciplinary fields of **Real-time Embedded System**, **On-device Machine Learning**, and **Adversarial Machine Learning**. My primary objective is to innovate scalable solutions that merge the efficiency of autonomous embedded systems with the capabilities of advanced machine learning. My active research initiatives encompass: (1) deploying machine learning models on real-time embedded devices, (2) system-application co-optimization of advanced machine learning systems, and (3) improving performance robustness in existing machine learning infrastructures.

Education

- **University of California, Riverside** — Riverside, California, USA
  Ph.D. student of Electronic Engineering; GPA: 4.00/4.00; Advisor: Cong Liu — *Aug 2022 - Now*
- **University of Texas at Dallas** — Richardson, Texas, USA
  Ph.D. student of Computer Science; GPA: 3.83/4.00; Advisor: Cong Liu — *Aug 2020 - Aug 2022*
- **Southern University of Science and Technology** — Shenzhen, China
  Bachelor of Computer Science and Technology; GPA: 3.57/4.00; Advisor: Yuqun Zhang — *July 2016 - July 2020*

Industrial Experience

- **Tencent** — Shanghai, China
  Research Internship — *May 2021 - Dec 2021*
  - **Responsibility**: Worked at Tencent Youtu Lab which focuses on advanced research on face recognition robustness.
  - **Research**: Research on transferable adversarial attack on face recognition systems.
- **Kwai** — Shenzhen, China
  Research & Development Internship — *Nov 2019 - Jul 2020*
  - **Responsibility**: Worked at Peer Content Delivery Network (PCDN) team which aims to develop and maintain PCDN system, involving technical stack: C++, C and Docker.
  - **Research**: Research on Peer Content Delivery Network (PCDN) optimization, including system-level optimization and application-level optimization.
  - **Engineering**: Updated the internal web protocol framework in PCDN backend to boost overall transmission speed of videos and decrease the retransmission ratio. Wrote tests for the backend service and deploy grey testing for over 10,000 third-party edge devices.

Publications

- **MIMONet: Multi-Input Multi-Output On-Device Deep Learning.**: Zexin Li, Xiaoxi He, Yufei Li, Shahab Nikkhoo, Wei Yang, Lothar Thiele, Cong Liu (submitted to ICRA'2024) [PDF]
- **R^3: On-device Real-Time Deep Reinforcement Learning for Autonomous Robotics.**: Zexin Li, Aritra Samanta, Yufei Li, Andrea Soltoggio, Hyoseung Kim, Cong Liu (RTSS'2023)
- **RED: A Systematic Real-Time Scheduling Approach for Robotic Environmental Dynamics.**: Zexin Li, Tao Ren, Xiaoxi He, Cong Liu (RTSS'2023)
- **PIMbot: Policy and Incentive Manipulation for Multi-Robot Reinforcement Learning in Social Dilemmas.**: Shahab Nikkhoo, Zexin Li, Aritra Samanta, Yufei Li, Cong Liu (IROS'2023) [PDF]
- **White-Box Multi-Objective Adversarial Attack on Dialogue Generation.**: Yufei Li, Zexin Li, Yingfan Gao and Cong Liu (ACL'2023) [PDF]
- **Dynamic Transformers Provide a False Sense of Efficiency.**: Yiming Chen, Simin Chen, Zexin Li, Wei Yang, Cong Liu, Robby Tan and Haizhou Li (ACL'2023) [PDF]
- **Sibling-Attack: Rethinking Transferable Adversarial Attacks against Face Recognition.**: Zexin Li*, Bangjie Yin*, Taiping Yao, Junfeng Guo, Shouhong Ding, Simin Chen, Cong Liu (CVPR'2023) [PDF]
- **Efficient algorithms for task mapping on heterogeneous CPU/GPU platforms for fast completion time.**: Zexin Li, Yuqun Zhang, Ao Ding, Husheng Zhou, Cong Liu (JSA'2021) [PDF]

Professional Service

- **Conference reviewer**: IEEE RTSS subreviewer, ICONIP.
- **Journal reviewer**: IEEE TPAMI, IEEE TNNLS, PPNA.

Honors and Awards

- Dean's Distinguished Fellowship, University of California, Riverside - May, 2022
- Tencent Rhino-BirdElite Talent Training Program, Tencent - May, 2021
- Outstanding Student Scholarship, Southern University of Science and Technology - Nov, 2019
- Special Funds for the Cultivation of Guangdong College Students' Scientific and Technological Innovation - Mar, 2019
- Special Funds for the Cultivation of Guangdong College Students' Scientific and Technological Innovation - Mar, 2018

Academic Supervision and Mentorship

- **Tao Ren**: U Pittsburgh Information Science, 2023–Current (Co-author; Current SDE in TikTok)
- **Aritra Samanta**: UCR CS, 2022–Current (Co-author; Current Ph.D. student at UCR)
- **Yifan Yu**: UCR CE, 2022–Current (Project; Current MS student at UCR)
- **Ao Ding**: SUSTech CSE, 2019–2020 (Co-author; Current master student at SUSTech)
- **Zelin Wang**: SUSTech CSE, 2019–2020 (Project; Current SDE in Meituan)
- **Shuqing Li**: SUSTech CSE, 2019–2020 (Project; Current Ph.D. student at CUHK)

Skills

- **Programming Languages**: C, C++, Python, Rust.
- **Machine Learning Frameworks**: Pytorch, Tensorflow, Caffe, Google JAX.
- **Robotic Frameworks**: ROS, ROS 2, Autoware.
- **Embedded Platforms**: NVIDIA Jetson Toolkit, Raspberry Pi, Google Coral Edge TPU.
- **Adversarial Machine Learning**: Energy attack, Transferable attack.

Reference

- **Cong Liu**: Associate Professor of Electrical and Computer Engineering, University of California, Riverside (UCR).
- **Yuqun Zhang**: Assistant Professor of Computer Science, Southern University of Science and Technology (SUSTech).
- **Wei Yang**: Associate Professor of Computer Science, University of Texas at Dallas (UTD).
- **Shouhong Ding**: Senior Researcher of Youtu Lab, Tencent.