Zexin Li

Email: zli536@ucr.edu
Portfolio: zexinli.com
Mobile: +1-945-217-4139
Github: github.com/zexinli0w0

Research Interests

My research interests lie in the interdisciplinary fields of **Real-time Embedded System** and **On-device 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. candidate of Electronic Engineering; GPA: 4.00/4.00; Advisor: Cong Liu — *Aug 2022 - Now*
- **University of Texas at Dallas** — Richardson, Texas, USA
  Ph.D. candidate of Computer Science (unfinished); 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. Conducted research on transferable adversarial attack on face recognition systems (CVPR'23).
- **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. Concudcted research on Peer Content Delivery Network (PCDN) optimization, including system-level optimization and application-level optimization. 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.

Conference Publications

- **BOXR: Body and head motion Optimization framework for eXtended Reality.**: Ziliang Zhang, Zexin Li, Hyoseung Kim, Cong Liu (RTSS'2024) [PDF]
- **DuoJoule: Accurate On-Device Deep Reinforcement Learning for Energy and Timeliness.**: Soheil Shirvani, Aritra Samanta, Zexin Li, Cong Liu (RTSS'2024) [PDF]
- **DeciX: Explain Deep Learning Based Code Generation Applications.**: Simin Chen, Zexin Li, Wei Yang, Cong Liu (FSE'2024) [PDF]
- **RT-LM: Uncertainty-Aware Resource Management for Real-Time On-Device Language Models.**: Yufei Li, Zexin Li, Wei Yang, Cong Liu (RTSS'2023) [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) [PDF]
- **RED: A Systematic Real-Time Scheduling Approach for Robotic Environmental Dynamics.**: Zexin Li, Tao Ren, Xiaoxi He, Cong Liu (RTSS'2023) [PDF]
- **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]

Journal Publications

- **Transferable Adversarial Attacks on ASR via Gradient Optimization.**: Xiaoxue Gao, Zexin Li, Yiming Chen, Cong Liu, Haizhou Li (IEEE SPL'2024) [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]

Preprint

- **Genie: Smart ROS-based Caching for Connected Autonomous Robots.**: Zexin Li, Soroush Bateni, Cong Liu (submitted to ICRA'2025) [PDF]
- **MIMONet: Multi-Input Multi-Output On-Device Deep Learning.**: Zexin Li, Xiaoxi He, Yufei Li, Wei Yang, Lothar Thiele, Cong Liu (submitted to ICRA'2025) [PDF]

Academic Service

- **Journal reviewer**: IEEE SPL, IEEE TPAMI, IEEE TNNLS, IEEE TCSVT, ACM TODAES, IJCV, PPNA.
- **Conference reviewer**: ICLR'25.
- **External Subreviewer**: RTSS'23, ICONIP'23, ECRTS'24, EMSOFT'24, RTAS'25.

Honors and Awards

- GSA Conference Travel Grants, University of California, Riverside - Dec, 2024
- 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

I have had the fortunate opportunity to mentor or collaborate with the following students.

- **Yiming Zeng**: UConn, CS, 2025–Now (Co-author; Current Ph.D. student at UConn).
- **Wanhao Yu**: UNC, CS, 2025–Now (Co-author; Current Ph.D. student at UNC).
- **Tong Zhang**: UCI CS, 2024–Now (Co-author; Current M.S. student at UCI).
- **Ziliang Zhang**: UCR CS, 2023–Now (Co-author; Current Ph.D. student at UCR).
- **Soheil Shirvani**: UCR CS, 2023–Now (Co-author; Current Ph.D. student at UCR).
- **Junhao Wang**: Tongji Univ. CS, 2024–2024 (Project; Current B.S. student at Tongji Univ.).
- **Tianyi Wang**: UCR ME, 2023–2024 (International Peer Mentorship Program; Current MS student at UCR).
- **Aritra Samanta**: UCR CS, 2023–2024 (Co-author; Current Ph.D. student at UCR).
- **Fengfan Zhou**: HUST CS, 2023–2023 (Project; Current Ph.D. student at HUST).
- **Shahab Nikkhoo**: UCR CS, 2022–2023 (Co-author; Current M.S. student at UCR).
- **Tao Ren**: Univ. Pittsburgh Information Science, 2022–2023 (Co-author; Current SDE in TikTok).
- **Yifan Yu**: UCR CE, 2022–2023 (Project; Current MS student at UCR).
- **Ao Ding**: SUSTech CSE, 2019–2020 (Co-author; Current M.S. 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).

Talks

- **2024/12 Invited Conference Talk**: *Workshop on Machine-learning enabled safety-Critical systems, IEEE Real-Time Systems Symposium (RTSS)*, Building Robust, Timing-Predictable On-Device Machine Learning Systems.
- **2024/12 Conference Talk**: *IEEE Real-Time Systems Symposium (RTSS)*, DuoJoule: Accurate On-Device Deep Reinforcement Learning for Energy and Timeliness.
- **2024/11 Guest Talk**: *UCR EE 260 Seminar in Electrical Engineering*, Towards Efficient Reinforcement Learning in Autonomous Embedded Systems.
- **2023/12 Conference Talk**: *IEEE Real-Time Systems Symposium (RTSS)*, R^3: On-device Real-Time Deep Reinforcement Learning for Autonomous Robotics.
- **2023/12 Conference Talk**: *IEEE Real-Time Systems Symposium (RTSS)*, RED: A Systematic Real-Time Scheduling Approach for Robotic Environmental Dynamics.
- **2023/11 Guest Talk**: *UCR Center for Robotics and Intelligent Systems (CRIS)* , On-device Real-Time Deep Reinforcement Learning for Autonomous Robotics.
- **2023/11 Guest Talk**: *UCR EE 260 Seminar in Electrical Engineering*, Autonomous Embedded Systems.

Teaching

- **Object-oriented Programming and Design**: Teaching Assistant for SUSTech Computer Science, 2019-2020.
- **Data Structure and Algorithm Analysis**: Teaching Assistant for SUSTech Computer Science, 2018-2019.

Skills

- **Programming Languages**: Advance in Python, skilled in C++, C.
- **Machine Learning Frameworks**: HuggingFace Transformers, PyTorch, PyTorch XLA, Tensorflow, Caffe, Google JAX.
- **Robotic Frameworks**: ROS, ROS 2, Autoware.
- **Embedded Platforms**: NVIDIA Jetson Toolkit, Raspberry Pi, Google Coral Edge TPU.
- **Adversarial Machine Learning**: Adversarial attack, Energy-oriented attack, Transferable attack.
- **Language**: Chinese(Native), English(Professional).

Reference

- **Cong Liu**: Associate Professor of Electrical and Computer Engineering, University of California, Riverside (UCR).
- **Nikil Dutt**: Distinguished Professor of CS, Cognitive Sciences, and EECS, UC Irvine (UCI).
- **Hyoseung Kim**: Associate Professor & Computer Engineering Program Chair, University of California, Riverside (UCR).
- **Jiachen Li**: Assistant Professor of Electrical and Computer Engineering, University of California, Riverside (UCR).
- **Yinglun Zhu**: Assistant 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).