Wenyi (Morty) ZHANG

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EDUCATION

University of California, San Diego Oct 2025 - Now
Ph.D. student. in Computer Science

University of California, San Diego Sep 2023 - June 2025
M.S. in Electronic and Computer Engineering (Data Science and Machine Learning track), **cGPA:** 3.88/4.0

University of California, Irvine, *3+2 Engineering Program* Sep 2022 - June 2023
Visiting student in Computer Engineering (Senior year), **cGPA:** 4.0/4.0

The Chinese University of Hong Kong, Shenzhen (CUHK-SZ) Sep 2019 - June 2023
B.Eng. in Electronic Information Engineering (Computer Engineering Stream), **cGPA:** 3.55/4.0
Awards: Bowen Scholarship 2019-2022; Inspirational Scholarship 2019-2022; Undergraduate Research Award 2021, 2022; Dean's List 2019-20, 2021-22; Shaw College Spirits Award 2021, 2022

PUBLICATION

Conferences

1. [**CCS' 25**] *Don't Look Up: There Are Sensitive Internal Links in the Clear on GEO Satellites.* **Wenyi Morty Zhang**, Annie Dai, Keegan Ryan, Dave Levin, Nadia Heninger, Aaron Schulman. *Proceedings of the 2025 ACM SIGSAC Conference on Computer and Communications Security. (CCS).* **Distinguished Paper Award**

2. [**PAM' 25**] *A Deep Dive into LEO Satellite Topology Design Parameters.* **Wenyi Zhang***, Zihan Xu*, Sangeetha Abdu Jyothi. *the 26th Annual Passive and Active Measurement Conference. (PAM).* (* = Co-primary Authors).

3. **[LEO-NET' 24]** *A First Look of LEO Satellite Network Resilience.* Zhuoyuan Li*, **Wenyi Morty Zhang***, Wenhao Chen, Yiyan Hu, Weyl Lu. *2024 ACM Workshop on LEO Networking and Communication (LEO-NET), Co-located with ACM MobiCom 2024.* (* = Co-primary Authors).

4. **[LEO-NET' 24]** *An In-Depth Investigation of LEO Satellite Topology Design Parameters.* **Wenyi Morty Zhang*,** Zihan Xu*, Sangeetha Abdu Jyothi. *2024 ACM Workshop on LEO Networking and Communication (LEO-NET), Co-located with ACM MobiCom 2024.* (* = Co-primary Authors).

5. **[IEEE VR' 23]** *CaV3: Cache-assisted Viewport Adaptive Volumetric Video Streaming.* Junhua Liu, Boxiang Zhu, Fangxin Wang, Yili Jin, **Wenyi Zhang**, Zihan Xu, Shuguang Cui. *2023 IEEE Conference Virtual Reality and 3D User Interfaces (VR).*

Journals

1. **[TMC' 25]** *Unimodal Training-Multimodal Prediction: Cross-modal Federated Learning with Hierarchical Aggregation.* Rongyu Zhang, Xiaowei Chi, **Wenyi Zhang**, Guiliang Liu, Yuan Du, Fangxin Wang. *arXiv preprint arXiv:2303.15486.*

2. **[TMC' 24]** *Privacy-Preserving Gaze-Assisted Immersive Video Streaming.* Yilin Jin, **Wenyi Zhang**, Zihan Xu, Junhua Liu, Fangxin Wang, Shuguang Cui. *IEEE Transactions on Mobile Computing.*

3. **[IoTJ' 24]** *Proffler: Toward Collaborative and Scalable Edge-Assisted Crowdsourced Livecast.* **Wenyi Zhang***, Zihan Xu*, Fangxin Wang, Jiangchuan Liu. *IEEE Internet of Things Journal (Volume: 11, Issue: 2, 15 January 2024).* (* = Co-primary Authors).

RESEARCH

Networking and Systems Group & WCSNG Lab, UC San Diego | *Supervisor: Prof. Aaron Schulman & Prof. Dinesh Bharadia*

- Measurement and Security of Satellite Networks. Oct 2023 - Now
  - Captured raw binary user traffic from multiple GEO satellites using EBSPro and satellite dishes, adhering to DVB-S/DVB-S2 standards to develop parsers for reassembling Data Link Layer traffic.
  - Investigating potential security vulnerabilities in GEO satellite-based communication, including RSA private key leakage and exposure of unencrypted user privacy data.
  - **Publication: Wenyi Morty Zhang**, Annie Dai, Keegan Ryan, Dave Levin, Nadia Heninger, Aaron Schulman. *Don't Look Up: There Are Sensitive Internal Links in the Clear on GEO Satellites. Proceedings of the 2025 ACM SIGSAC Conference on Computer and Communications Security. (CCS).* **Distinguished Paper Award**

- Distributed Spectrum Sensing. Apr 2024 - Now
  - Designed a distributed spectrum sensing platform utilizing Pluto SDR and an Android phone, leveraging the Maia-SDR for implementation.
  - Enabled real-world spectrum measurements across a broad frequency range, incorporating GPASDO and reference signals to calibrate and synchronize multiple SDRs for Carrier Frequency Offset (CFO) correction.
    Achieved accurate signal localization and detection based on synchronized recordings.

Networking, Systems, and AI Lab (NetSAIL), UC Irvine | *Supervisor: Prof. Sangeetha Abdu Jyothi*

- Topology Design and Routing of LEO Satellite Networks Aug 2022 - Aug 2023
  - Surveyed and summarized the literature on routing and topology design of satellite network system, and built the environment and satellite

network simulators, Hypatia and Starperf.

- Measured the performance of the shortest path based on the Dijkstra's algorithm using static routing tables for the topological structure of satellite networks with the +Grid strategy (a mesh-like connectivity mechanism), as well as the round-trip time (RTT) and throughput of dynamic satellite networks on the simulators.
- **Publication:**
  1) **Wenyi Zhang***, Zihan Xu*, Sangeetha Abdu Jyothi. *An In-Depth Investigation of LEO Satellite Topology Design Parameters*, *2024 ACM Workshop on LEO Networking and Communication (LEO-NET)*.
  2) **Wenyi Zhang***, Zihan Xu*, Sangeetha Abdu Jyothi. *A Deep Dive into LEO Satellite Topology Design Parameters. the 26th Annual Passive and Active Measurement Conference. (PAM 2025).*

Intelligent Networking and Multimedia Lab, CUHK-SZ | *Paid RA, Supervisor: Prof. Fangxin Wang*

- Multi-modal Federated Learning — Jun 2022 - Oct 2022
  - Designed HA-Fedformer, a novel transformer-based model that empowers unimodal training with only an unimodal dataset at the client and multimodal testing by aggregating multiple clients' knowledge for better accuracy
  - Experiments on popular sentiment analysis benchmarks, CMU-MOSI and CMU-MOSEI, demonstrated that HA-Fedformer significantly outperforms SOTA multimodal models under the UTMP federated learning frameworks, with 15%-20% improvement on most attributes
  - **Result:** Rongyu Zhang, Xiaowei Chi, **Wenyi Zhang**, Guiliang Liu, and Fangxin Wang. *Unimodal Training-Multimodal Prediction: Cross-modal Federated Learning with Hierarchical Aggregation*, submitted to IEEE Transactions on Mobile Computing.
- Volumetric Video (VV) Streaming – client-side cache-assisted content transmission — May 2022 - Sep 2022
  - Proposed CaV3, an integrated cache-assisted viewport adaptive VV streaming framework, which employs a Long-short term Sequential prediction model (LSTSP) to achieve accurate short-, mid-, and long-term viewing pattern prediction with a multi-modal fusion model by capturing the viewer's behavior inertia, current attention, and subjective intention.
  - Collected a comprehensive dataset with sufficient practical unbounded 360° scenes, conducted extensive evaluation of CaV3 on the dataset, results confirming the superiority of CaV3, which outperformed SOTA algorithm by 15.6%-43% in viewport prediction and 13%-40% in system utility.
  - **Publication:** Junhua Liu, Boxiang Zhu, Fangxin Wang, Yili Jin, **Wenyi Zhang**, Zihan Xu, Shuguang Cui. *CaV3: Cache-assisted Viewport Adaptive Volumetric Video Streaming*, accepted the 30th IEEE Conference on Virtual Reality and 3D User Interfaces. (VR 2023).
- User-aware Viewpoint Prediction of 360° Video Streaming — Aug 2021 - May 2022
  - Considering the lack of eye gazing in existing datasets, collected a dataset of the head and gaze behaviors of users watching a 360° video, which outperforms existing datasets with rich dimensions, large scale, strong diversity, and high sampling frequency.
  - Designed a new FoV prediction approach using a cross-modal attention mechanism, which effectively extracts historical FoV trajectory, video content, and gaze information for joint analysis; conducted extensive experiments, which showed 26.24% improved performance on average compared to SOTA algorithms.
  - **Publication:** Yilin Jin, **Wenyi Zhang**, Zihan Xu, Junhua Liu, Fangxin Wang, and Shuguang Cui. *Exploring Gaze Behavior in 360-Degree Videos: Dataset and Multimodal Attentive FoV Prediction*, accepted by IEEE Transactions on Mobile Computing. (2024).
- Video Streaming Distribution Optimization in Edge Computing — Dec 2020 - Aug 2021
  - Proposed Proffler, an integrated framework that enables effective stream caching at the network edge server
  - Examined the underlying correlations in viewing patterns across different regions and proposed a novel transformer-based algorithm, Chili-TF, that achieves accurate viewer request prediction, even for regions with insufficient data
  - Designed a scalable algorithm, U2VR, that achieves near-optimal video stream allocation as well as viewer scheduling, and conducted extensive experiments based on real data for validation
  - **Publication: Wenyi Zhang***, Zihan Xu*, and Fangxin Wang. *Proffler: Towards Collaborative and Scalable Edge-Assisted Crowdsourced Livecast*, accepted by IEEE Internet of Things Journal. (2023).

EXTRACURRICULAR TECHNICAL ACTIVITIES

China College Students' IC Innovation and Entrepreneurship Competition | *Team Leader* — Jan 2021 - Oct 2021

- Built a handwritten digit (from 0 to 9) recognition device on a Nexys Video Artix-7 FPGA board (required by the competition), implemented the RISC-V instruction set architecture, and constructed the Linux environment
- Trained and tested a LeNet-5 model with Python and C++, and deployed the model with Vivado HLS to construct the handwritten digit recognition IP core, achieving recognition accuracy of 79.55%
- **Award:** 3rd Prize in the Southern China Finals

Shenzhen Institute of Artificial Intelligence and Robotics for Society (AIRS) | *Teaching Assistant* — Jun 2021 - Sep 2021

- Assisted with the institute's summer camp about unmanned boat
- Calibrated the inertia measurement unit (IMU), designed an adaptive PID controller of the steering gear with Arduino Nano and Uno boards

LEADERSHIP

Billiards Club & Shaw College Billiard Club, CUHK-SZ | *Founder, President* — Nov 2019 - June 2022

- Recruited 70+ members in the first year within the school and another 100+ across schools in 2020 and 2021
- Hosted monthly training sessions for billiard sports aficionados, prepared teaching materials like technical documents and recorded matches, and organized team outings
- Collaborated with administrative offices and other student organizations to host on-campus activities like the 2020 and 2021 Freshman Cup, 2021 CUHK-SZ Sports Festival (billiard games)

SKILLS AND PROFICIENCIES

Languages	English (*Proficient*), Mandarin (*Native-speaker).*
Software	Python, C++, R, SQL; GNURadio, MATLAB, Vivado, Arduino, Photoshop, MS Office.
Interests	Billiards, Basketball, Violin**.**