Christina Shin

• Email: cshin956@usc.edu • LinkedIn: https://linkedin.com/in/christina-sy-shin • Homepage: https://christina-shin.github.io

---

INTERESTS Computer Networking, Mobile Computing, Autonomous & Connected Vehicles, AR/VR Systems, Volumetric Video Streaming, 3D Data Processing, 3D Mapping

EDUCATION

University of Southern California, Los Angeles, California

- **Ph.D. Candidate** in Computer Science   Jan 2026 (Expected)
  Dissertation (in progress): Harnessing Vehicular 3D Primitives for Networked Scene Operation and Manipulation

Ewha Womans University, Seoul, Republic of Korea

- **M.S.** in Computer Science and Engineering   Feb 2019
  Thesis: Network Diagnosis and Reconstruction in Vehicular Ad-Hoc Networks
- **B.S.** in Computer Science and Engineering   Feb 2017

EXPERIENCE

General Motors, Warren, Michigan

Research Intern & Collaborator (Mentors: Fan Bai and Chuan Li)   May 2021 – Present

- Designed and implemented a volumetric video delivery system for vehicles, enabling low-latency and immersive AR passenger experiences; co-authored a U.S. patent application.
- Developed a 3D traffic reconstruction system using multi-vehicle point cloud registration, generating volumetric videos of dynamic traffic scenes to improve scalability and scene understanding; co-invented to a U.S. patent application (now abandoned).

Networked Systems Lab, University of Southern California

Research Assistant (Advisor: Prof. Ramesh Govindan)   Aug 2019 – Present

- Invented an infrastructure-assisted autonomous driving system that leverages roadside LiDARs and edge compute to extend vehicle perception beyond occlusions.
- Devised a 3D building reconstruction system with a LiDAR-equipped UAV, optimizing path planning for data capture and generating near real-time SLAM-based 3D models of buildings.
- Contributed to a live volumetric video streaming system, focusing on the 3D video rendering pipeline to ensure real-time visualization of captured scenes.

Intelligent Networked Systems Lab, Ewha Womans University

Research Assistant (Advisor: Prof. HyungJune Lee)   Jan 2017 – May 2019

- Designed a traffic density estimation algorithm using opportunistic V2V packet probing under strict time deadlines.
- Proposed a multi-UAV relay algorithm for network recovery, improving resilience of ad-hoc networks in failure scenarios.

PUBLICATION

CONFERENCE

- Toward Bandwidth-adaptive Fully-Immersive Volumetric Video Conferencing
  Rajrup Ghosh, **Christina Suyong Shin**, Lei Zhang, Muyang Ye, Tao Jin, Harsha V. Madhyastha, Ravi Netravali, Antonio Ortega, Sanjay Rao, Anthony Rowe, Ramesh Govindan
  International Conference on emerging Networking EXperiments and Technologies (ACM CoNEXT), 2025 (conditionally accepted).

- RECAP: 3D Traffic Reconstruction
  Christina Suyong Shin, Weiwu Pang, Chuan Li, Fan Bai, Fawad Ahmad, Jeongyeup Paek, and Ramesh Govindan
  International Conference on Mobile Computing and Networking (ACM MobiCom), 2024.

- Cooperative Infrastructure Perception
  Christina Suyong Shin*, Fawad Ahmad*, Weiwu Pang*, Branden Leong, Pradipta Ghosh, and Ramesh Govindan (* equal contributions)
  International Conference on Internet-of-Things Design and Implementation (IEEE/ACM IoTDI), 2024.

- AeroTraj: Trajectory Planning for Fast and Accurate 3D Reconstruction Using a Drone-based LiDAR
  Fawad Ahmad, **Christina Suyong Shin**, Rajrup Ghosh, John D'Ambrosio, Eugene Chai, Karthikeyan Sundaresan, and Ramesh Govindan
  Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (ACM Ubicomp/IMWUT), 2023.

- Progressive ad-hoc route reconstruction using distributed UAV relays after a large-scale failure
  Christina Suyong Shin, So-Yeon Park, JinYi Yoon, and HyungJune Lee
  IEEE Wireless Communications and Networking Conference (IEEE WCNC), 2018.

- DroneNet+: Adaptive Route Recovery Using Path Stitching of UAVs in Ad-Hoc Networks
  So-Yeon Park, Dahee Jeong, **Christina Suyong Shin**, and HyungJune Lee
  IEEE Global Communications Conference (IEEE GLOBECOM), 2017.

JOURNAL

- Infrastructure-less Vehicle Traffic Density Estimation via Distributed Packet Probing in V2V Network
  Christina Suyong Shin, JiHo Lee, and HyungJune Lee
  IEEE Transactions on Vehicular Technology (IEEE TVT), vol. 69, no. 10, Oct 2020.

- DroneNetX: Network Reconstruction through Connectivity Probing and Relay Deployment by Multiple UAVs in Ad-Hoc Networks
  So-Yeon Park, **Christina Suyong Shin**, Dahee Jeong, and HyungJune Lee
  IEEE Transactions on Vehicular Technology (IEEE TVT), vol. 67, no. 11, Nov 2018.

UNDER SUBMISSION

- Vehicular AR Streaming. *Submitted to ACM MobiCom 2025.*
- Vehicular AR Tracking. *Submitted to ACM MobiCom 2025.*

AWARDS & HONORS

- Annenberg Fellowship, University of Southern California   2019
  Awarded to outstanding Ph.D. students joining in Fall 2019.

- Qualcomm Innovation Awards, Qualcomm x Ewha   2017
  Recognized for proposing a lightweight network hole replacement algorithm through UAV-net.

- Silver Prize in Graduation Capstone Design, Ewha Womans University   2016
  For an outstanding project developing *SimMusic*, a language that encodes music notes and plays them on *Lego Mindstorms NXT*.

- Dean's List, Ewha Womans University   2013, 2015, 2016
  For attaining a GPA above 3.75/4.3.

- NSF/SIGMOBILE Travel Grants: ACM MobiCom '25, ACM HotMobile '24.

TEACHING & MENTORING

TEACHING ASSISTANT

University of Southern California

- Internetworking (CSCI 353)   Fall 2025
- Computer Networks (CSCI 551/651)   Fall 2023

Ewha Womans University

- Computer Architecture (20493-02)   Fall 2018
- Arduino Programming (11208-01)   Spring 2018
- C Programming (38407-05)   Fall 2017
- Programming Language Theory (20499-01, 20499-02)   Spring 2017

MENTORING

- Alejandra Cortes (High school): 3D perception with point clouds   Summer 2023
- Alexander Due (Undergrad): Object-oriented point cloud registration   Summer 2023
- Zaki Cole (Undergrad): Automated data collection in CARLA simulator   Fall 2022

TECHNICAL SKILLS

Languages: C++, Python, MATLAB, C, C#, Java

Systems & Tools: Linux, Git, Docker, ROS, CARLA, AirSim, Unity, PyTorch, TensorFlow