

ENGUANG FAN

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EDUCATION

University of Illinois, Urbana-Champaign, IL, USA Aug 2024 – May 2027
PhD Student

University of Illinois, Urbana-Champaign, IL, USA Aug 2022 – May 2024
Master of Computer Science

University of Illinois, Urbana-Champaign, IL, USA Aug 2019 – Aug 2022
*B.S. in Statistics & Computer Science, **Highest Distinction***

PUBLICATIONS

- [1] **Enguang Fan**, Anfeng Peng, Matthew Caesar, Jae H Kim, Josh Eckhardt, Greg Kimberly, Denis Osipychev. “Towards Effective Swarm-Based GPS Spoofing Detection in Disadvantaged Platforms.” In *MILCOM 2023 - 2023 IEEE Military Communications Conference (MILCOM)*, Boston, USA, Oct 2023, pp. 7.
- [2] Emerson Sie*, **Enguang Fan***, Federico Cifuentes-Urtubey, Deepak Vasisht. “Crowdsourcing Ubiquitous Indoor Localization with Non-Cooperative Wi-Fi Ranging.” In *arXiv preprint*, 2025. <https://arxiv.org/abs/2506.18317>
- [3] **Enguang Fan***, Emerson Sie*, Federico Cifuentes-Urtubey, Deepak Vasisht. “Scalable Indoor Localization with Non-Cooperative Wi-Fi Ranging.” In *Proceedings of the 31th Annual International Conference on Mobile Computing and Networking (MobiCom)*, Hong Kong, China, Nov 2025. **Best Poster Runner-Up**.

INTERNSHIP

Student Researcher, Google May 2025 – August 2025, Mountain View, CA
Android Location Team — the team behind indoor positioning in Google Maps and Android Location Services.

Supervised by Dr. Roy Want

- Designed and developed an advanced indoor localization prototype combining Wi-Fi Round Trip Time (RTT) and motion sensor fusion on pixel phone, achieving substantially lower latency and higher accuracy than Google’s production *Fused Location Provider (FLP)* under challenging indoor environments (DFS channels, multipath-heavy areas).
- Implemented a passive Wi-Fi listening framework that reuses cached scan results from FLP to enable continuous RTT-based ranging without active scans, reducing localization update **latency by 57%** and eliminating blackout periods.
- Built a high-precision pedestrian dead reckoning (PDR) module leveraging Android’s step detector and orientation sensors, and fused it with Wi-Fi RTT measurements through a multi-state Kalman filter, achieving **0.8 meter indoor localization accuracy** at 90% CDF using existing commercial Wi-Fi infrastructure.
- Contributed to ongoing efforts to integrate Wi-Fi RTT capabilities into Google’s Fused Location Provider framework for next-generation indoor localization.

RESEARCH EXPERIENCE

Crowdsourcing Ubiquitous Indoor Localization with Wi-Fi Ranging Oct 2024 – May 2025
Supervised by Prof. Deepak Vasisht

- Designed and implemented *PeepLoc*, a scalable indoor localization system that utilizes non-cooperative Wi-Fi Ranging measurements and IMU-based pedestrian dead reckoning (PDR) for accurate localization without any infrastructure support or PHY-layer access.

- Proposed a probabilistic backend for geolocating access points using one-way time-of-flight (ToF) estimates fused with PDR-based pedestrian trajectories, solving a joint non-linear least squares problem under noise and clock offset uncertainty.
- Developed a per-AP adaptive ranging model to account for Non Line-of-sight (NLOS) induced multipath distortion and hardware-induced RTT slope deviations, improving end-to-end client localization accuracy in complex indoor environments.
- Demonstrated that PeepLoc outperforms the Android Fused Location Provider (FLP) by over 40% in mean error (3.41 m vs. 7.71 m) across four real-world campus buildings, while maintaining zero dependency on 802.11mc/az protocols or GPS availability indoors.

Swarm-Based GPS Spoofing Detection by Multimodal Sensor Fusion May 2023 – Aug 2023

Supervised by Prof. Matthew Caesar

- Contributed to a research project focused on enhancing GPS spoofing detection in disadvantaged platforms, such as light weight drones in modern battlefields.
- Proposed an EKF based architecture for sensor fusion, intelligently combining observations across multiple sensors to detect GPS spoofing and reconstruct coordinates with confidence levels.
- Utilized simulation studies based on real-world mobility and sensor traces to demonstrate that the proposed approach significantly improves location accuracy and lower the error variance compared to baseline techniques.

Probabilistic Programming May 2020 – Feb 2021

Supervised by Prof. Sasa Misailovic

- Joined the creation and implementation of a cutting-edge system for transforming probabilistic programs. This involved devising algorithms that automatically modify program structures to enhance robustness against data variability and uncertainty.
- Pioneered the integration of advanced statistical methods within the system, enabling it to anticipate and adapt to diverse probabilistic scenarios, significantly improving the accuracy and reliability of program predictions.
- Conducted extensive robustness assessments of probabilistic programs using Stan and R. My involvement in benchmarking, simulation, and performance modeling contributed to breakthroughs in understanding program behavior and efficiency under varying conditions, setting new standards in the field.

HONORS

- MobiCom 2025 Best Poster Runner-Up
- MobiCom 2025 Student Travel Grant
- IEEE MILCOM 2023 Student Travel Grant [\[Link\]](#)
- UIUC Fall 2022 Teachers(TA) Ranked as Excellent by Their Students [\[Link\]](#)

SKILLS

- Programming: C/C++, Java, Python, Matlab
- Tools: PyTorch, Tensorflow, NumPy, OpenCV, ROS/ROS2, CMake, Gazebo
- Techniques: Object-Oriented Design, Unit Testing

SERVICE

- ISIBER 2026 (Reviewer)
- IROS 2026 (Reviewer)
- PRICAI 2025 (Reviewer)
- OSDI 2025 (Artifact Evaluation Reviewer)
- SIGCOMM 2025 (Artifact Evaluation Reviewer)
- EuroSys 2026 (Artifact Evaluation Reviewer)