

# Yanbing Liu

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## Research Interest

My current research interests are in the area of mobile networking, with a focus on 5G/6G networks measurement and design.

## Education

Purdue University, West Lafayette, USA Aug. 2021 - Present

**Ph.D** in Department of Computer Science

Advisor: Prof. Chunyi Peng

University of Science and Technology of China (USTC), Hefei, P.R.China Sep. 2017 - Jun. 2020

**M.E.** in Department of Electronic Engineering and Information Science

Advisor: Prof. Guo Wei

**National Scholarship (Top 1%)**, 2018

University of Science and Technology of China (USTC), Hefei, P.R.China Sep. 2013 - Jun. 2017

**B.E.** in Department of Electronic Engineering and Information Science

## Professional Experience

Purdue University, West Lafayette, USA Aug. 2024 - Present

**Teaching Assistant**

Purdue University, West Lafayette, USA Aug. 2021 - May. 2024

**Research Assistant**

AT&T Labs, Bedminster, USA Jun. - Aug. 2023, 2024, 2025

**Research Intern**

## Research Experience

**5G ON-OFF** Dec. 2024 - May. 2025

- Uncovered 5G ON-OFF loops where user devices oscillate between 5G activation and deactivation, causing severe throughput degradation.
- Conducted a large-scale measurement study to classify loop types, quantify their prevalence and impact, and reveal how inconsistent triggering conditions between 5G ON and OFF states lead to persistent loops.

**5G in the Sky** Dec. 2023 - May. 2024

- Conducted drone-based field experiments to demonstrate both the high potential and instability of 5G performance in the sky.
- Diagnosed the underlying causes of under-utilized 5G resources and performance variability in the sky.

**Failure Handling in 5G RAN** Mar. 2023 - Oct. 2023

- Revealed three categories of problematic failure handling behaviors in secondary radio access procedures through in-depth 5G measurement studies.
- Identified root causes in radio access configurations and quantified their impact on user performance.

**Dependent Misconfigurations in 5G/4.5G** Oct. 2022 - May. 2023

- Designed and implemented a *Delta State Machine (DSM)* model to examine problematic dependencies across varying RRC configurations.
- Applied DSM to large-scale datasets to automatically detect and validate real-world misconfiguration instances.

**Enhancing Carrier Aggregation Beyond 5G** Jan. 2022 - Jul. 2022

- Discovered real-world examples of sequential and sluggish carrier aggregation procedures.
- Performed trace-driven evaluation to show the benefit of our proposed new design CA++.

## 5G Experience Measurement

Apr. 2021 – Jul. 2022

- Performed extensive measurement campaigns across major U.S. operators to characterize 5G coverage, availability, and performance in the wild.
- Identified key configuration and policy issues leading to missed 5G performance and analyzed their root causes.
- Designed and validated a patch solution, *5GBoost*, that effectively improves 5G usability and throughput potential.

## Selected Publications

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- **Yanbing Liu**, Jingqi Huang, Sonia Fahmy and Chunyi Peng, "An In-Depth Look into 5G ON-OFF Loops in the Wild," *ACM Internet Measurement Conference (IMC '25)*, Oct 2025.
- **Yanbing Liu**, Jingqi Huang, Ziyu Li and Chunyi Peng, "5G in the Sky: Uplink Throughput Measurement, Analysis and Enhancement," *IEEE/ACM Transactions on Networking*, 2025.
- **Yanbing Liu**, and Chunyi Peng, "Handling Failures in Secondary Radio Access Failure Handling in Operational 5G Networks," *IEEE Transactions on Mobile Computing*, 2024.
- **Yanbing Liu**, Jingqi Huang and Chunyi Peng, "The Sky is Not the Limit: Unveiling Operational 5G Potentials in the Sky," *IEEE/ACM International Symposium on Quality of Service (IWQoS '24)*, Jun 2024.
- **Yanbing Liu**, Junpeng Guo and Chunyi Peng, "Demystifying Secondary Radio Access Failures in 5G," *The 25th International Workshop on Mobile Computing Systems and Applications (HotMobile '24)*, Feb 2024.
- \*Zhehui Zhang, \***Yanbing Liu**, Qianru Li, Zizheng Liu, Chunyi Peng, and Songwu Lu, "Dependent Misconfigurations in 5G/4.5G Radio Resource Control," *ACM International Conference on emerging Networking EXperiments and Technologies (CoNEXT '23)*, Dec 2023.
- \*Qianru Li, \*Zhehui Zhang, **Yanbing Liu**, Zhaowei Tan, Chunyi Peng and Songwu Lu, "CA++: Enhancing Carrier Aggregation Beyond 5G," *The 29th International Conference on Mobile Computing and Networking (MobiCom '23)*, Oct 2023.
- **Yanbing Liu** and Chunyi Peng, "A Close Look at 5G in the Wild: Unrealized Potentials and Implications," *IEEE International Conference on Computer Communications (INFOCOM '23)*, May 2023.
- **Yanbing Liu**, Xiaowei Qin, Ting Zhu, Xiaohui Chen and Guo Wei, "Improve MPTCP with SDN: From the perspective of resource pooling," *Journal of Network and Computer Applications*, vol. 141, pp. 73-85, Sep 2019.
- **Yanbing Liu**, Xiaowei Qin, Tianyi Zhang, Ting Zhu, Xiaohui Chen and Guo Wei, "Decoupled TCP Extension for VLC Hybrid Network," *IEEE/OSA Journal of Optical Communications and Networking*, vol. 10, no. 5, pp. 563-572, May 2018.
- **Yanbing Liu**, Xiaowei Qin, Ting Zhu, Xiaohui Chen and Guo Wei, "BESS: BDP Estimation Based Slow Start Algorithm for MPTCP in mmWave-LTE Networks," *2018 IEEE 88th Vehicular Technology Conference (VTC Fall)*, 2018.