

# Yanbing Liu

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## Education

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| Sep. 2017 - Present   | University of Science and Technology of China (USTC), Hefei, P.R.China<br><b>M.S.</b> in Department of Electronic Engineering and Information Science<br>Advisor: Prof. Guo Wei<br>GPA: 3.80/4.3 |
| Sep. 2013 - Jun. 2017 | University of Science and Technology of China (USTC), Hefei, P.R.China<br><b>B.E.</b> in Department of Electronic Engineering and Information Science<br>GPA: 3.65/4.3                           |

## Research Interest

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Computer Networks, Multipath Transmission, Network Protocol Design

## Research Experience

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- Graph Neural Network (GNN) based MPTCP Scheduler Design** May 2019 - Jul. 2019
- Tested and analyzed performance degradation of MPTCP in heterogeneous networks
  - Based on GNN, designed novel subflow management module and scheduler for MPTCP to improve its performance in heterogeneous networks
  - Led team members to implement, train and evaluate our GNN models with Tensorflow
  - Implemented improved modules in MPTCP Linux kernel
  - Established testbed and evaluated performance with Mininet and Floodlight controller
- Improve MPTCP with Software Defined Network (SDN)** May 2018 - Jul. 2018
- Leveraging global information collected by SDN, designed novel routing and congestion control schemes for MPTCP to achieve fast, efficient and fair resource exploration and allocation
  - Modified MPTCP Linux kernel and Floodlight controller to implement functions in the design
  - Established testbed and evaluated performance with Mininet and Floodlight controller
- Optimize MPTCP's Slow Start in Millimeter Wave (mmWave) Networks** Jan. 2018 - Apr. 2018
- Simulated mmWave networks and then tested MPTCP's performance with NS-3-DCE
  - Analyzed test results and found slow start was the main reason of throughput degradation of MPTCP
  - Proposed a BDP estimation based slow start algorithm for MPTCP to address above problem
  - Evaluated performance through simulation with NS-3-DCE
- Decouple TCP for Visible Light Communication (VLC) networks** Jul. 2017 - Dec. 2017
- Extended TCP and MPTCP to decouple uplink and downlink and enable TCP transmission in VLC networks
  - Modified TCP and MPTCP Linux kernel to realize functions
  - Evaluated performance in a real VLC hybrid network

## Publications

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Accepted:

- **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.

Submitted:

- **Yanbing Liu**, Xiaowei Qin, Xiaohui Chen, and Guo Wei, "G-MPTCP: Improve Multipath TCP in Heterogeneous Networks with Graph Neural Network," Submitted to *IEEE Conference on Computer Communications (INFOCOM)*, 2020.

## Computer Skills

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Programming:	C, C++, Python, Java, Matlab, $\LaTeX$
Kernel & Software:	Linux Kernel, NS-3, NS-3-DCE, Mininet, Floodlight, Tensorflow

## Honors and Awards

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2018	National Scholarship (Top 1%).
2014 - 2016	Outstanding Student Scholarship (Silver Award), USTC

## Standardization Examination

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GRE:	V: 157, Q: 170, AW: 3.5
IELTS:	7.0