Tianxin Wang

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Linkedin | Github | Google Scholar | Website

Education

- **Imperial College London** — *Sep 2023 - On*
  *Ph.D. visiting student, advised by **Prof. Geoffrey Ye Li** [🌐]* — London, U.K.
- **Shanghai Jiao Tong University (SJTU)** — *Sep 2020 - Sep 2025 (Expected)*
  *Ph.D. candidate, Information and Communication Engineering, advised by **Prof. Xudong Wang** [🌐]* — Shanghai, China
  - Full scholarship of Zhiyuan Honors Doctorate Program , GPA: 3.8/4.0
- **Hong Kong Polytechnic University** — *Sep 2017 - Jan 2018*
  Exchange student, Electronic Information Engineering — Hong Kong, China
  - GPA: 4.0/4.0
- **Southeast University (SEU)** — *Sep 2016 - Jun 2020*
  B.S., Information Science and Engineering — Nanjing, China
  - Grade: 91.2/100 (Ranking: Top 5%)

Research and Work Experience

- **Intelligent Transmission and Processing Laboratory, Imperial College London [🌐]** — *Sep 2023 - On*
  Graduate Research Assistant — London, U.K.
  - Worked on **AI for Communications**: test-time adaptation of neural receivers, collaborative learning for developing for generalizable and robust neural receivers
- **Wireless Networking and Artificial Intelligence Lab, UM-SJTU Joint Institute [🌐]** — *Sep 2020 - On*
  Graduate Research Assistant — Shanghai, China
  - Worked on **AI for Networks**: network slicing for radio access networks, resource and topology planning for high-frequency backhaul mesh networks, and etc.
- **National Mobile Communications Research Laboratory, Southeast University** — *Jan 2019 - Jun 2019*
  Undergraduate Research Assistant — Nanjing, China
  - Implemented several signal processing algorithms, e.g., MUSIC, for a 5.8GHz multi-antenna radar system, and conducted human movement detection based on the received wireless signals
- **Siemens Technology China** — *Jun 2019 - Aug 2019*
  Software Engineering in Department of Internet-of-Things (IoT) — Suzhou, China
  - Deployed network services and virtual networking computing modules for Siemens remote medical treatment platform

Publications and Patents

C=Conference, J=Journal, P=Patent, S=In Submission

[J.1] **T. Wang**, S. Chen, Y. Zhu, A. Tang and X. Wang, "*LinkSlice: Fine-Grained Network Slice Enforcement Based on Deep Reinforcement Learning*," **IEEE Journal on Selected Areas in Communications**, vol. 40, no. 8, pp. 2378-2394, Aug. 2022. **[JCR-Q1, IF = 13.8]** [Paper]

[J.2] **T. Wang** and X. Wang, "*DeepRP: Bottleneck Theory Guided Relay Placement for 6G Mesh Backhaul Augmentation*," accepted by **IEEE Transactions on Mobile Computing**, Oct. 2024. **[JCR-Q1, IF = 7.7]** [Paper]

[J.3] **T. Wang**, X. Wang and Y. -B. Lin, "*SideSeeker: Contention-Based Distributed Relay Finding for Sidelink Mesh Networks*," **IEEE Wireless Communications Letters**, vol. 13, no. 10, pp. 2802-2806, Oct. 2024 [Paper]

[C.1] **T. Wang**, S. Wang, X. Wang, and G. Y. Li, "*Collaborative Learning for Less Online Retraining of Neural Receivers*," in Proceedings of **IEEE Workshop on Machine Learning for Signal Processing (MLSP)**, 2024. [Paper]

[C.2] **T. Wang** and X. Wang, "*Boosting Capacity for 6G Terahertz Mesh Networks Based on Bottleneck Structures*," in Proceedings of **IEEE Global Communications Conference (GLOBECOM)**, 2023, pp. 4589-4594. [Paper]

[S.1] **T. Wang**, X. Wang, and G. Y. Li, "*GraphRx: Graph-Based Collaborative Learning among Multiple Cells for Uplink Neural Receivers*," submitted to **IEEE Conference on Computer Communications (INFOCOM 2025)**.

[S.2] S. Wang, **T. Wang**, and X. Wang, "*FedPDA: Collaborative Learning for Reducing Online-Adaptation Frequency of Neural Receivers*," submitted to **IEEE Conference on Computer Communications (INFOCOM 2025)**.

[P.1] **T. Wang**, A. Tang, X. Wang, and Z. Li, "*A Method for Distributed Network Topology Reconfiguration Under Centralized Coordination*," **Patent Application**, PCT/CN2023/085658, Mar. 2023.

Selected Research Projects

Comm. = communications, Net. = networks

- **AI for Comm.: Personalized Federated Learning for OFDM Neural Receivers** *Aug 2023 - Jul 2024*
  - Designed a collaboration-graph-based personalized federated learning framework (***GraphRx***) to collaboratively retrain uplink neural receivers among multiple cells in online environments
  - Derived an approximate generalization bound to enable optimization of the collaboration graph at the server without accessing local data
  - Achieved 0.5-2.1dB gain in coded BER gain compared with baseline schemes
- **AI for Net.: DRL-based Relay Placement for 6G Mesh Backhaul Networks** *Jul 2022 - Jul 2023*
  - Established a clique-based bottleneck theory: 1) deriving fairness-based network throughput with a bottleneck structure of bottleneck cliques; 2) quantifying the impact of each clique on the throughput
  - Designed a deep reinforcement learning (DRL) based relay placement scheme (***DeepRP***) guided by the bottleneck theory, so that the backhaul architecture is augmented by adding relays
  - Achieved 10.4-32.1% throughput gain than those of baseline schemes
- **AI for Net.: DRL-based Network Slice Enforcement in Multi-Cell Network Slicing** *Sep 2020 - Dec 2021*
  - Designed a DRL-based slice enforcement framework (***LinkSlice***) for fine-grained resource allocation across multiple cells, where DRL is combined with a greedy algorithm to enable efficient learning
  - Optimized radio resource consumption while ensuring soft slice isolation, QoS requirements, and conformance to long-term slicing policies
  - Achieved a notable spectral efficiency gain of 18.5% compared with baseline schemes

Honors and Awards

- Full scholarship of SJTU Zhiyuan Honors Doctorate Program[🌐] *2020 - 2025*
- First prize (Top 3/70) in Oral Presentation of 2023 SJTU Boxue Zhiyuan Doctoral Academic Forum [🌐] *2023*
- Shanghai Jiao Tong University Merit Student *2021, 2022*
- Southeast University Merit Student *2019, 2020*
- Grand prize (the highest award, top 1%) in National English Competition for College Students (NECCS) *2019*
- First prize in SEU Mathematical Contest in Modeling (MCM) *2018*
- Han Sang Scholarship (Southeast University) *2017*

Service Experience

- Reviewer for IEEE Transactions on Vehicle Technologies (TVT) *2024*
- Peer review assistant for IEEE Conference on Computer Communications (INFOCOM) *2021,2022,2023*
- Teaching assistant of Probability and Random Processes, Computer Networks *2020, 2023*

Technical Skills

- **Knowledge Base:** wireless communication theory, computer networks, deep learning, 3GPP standards especially on MAC protocols [TS 38.821], NR sidelink [TS 38.885,TS 38.886], access to unlicensed spectrum [TS 38.889]
- **Programming Languages:** Python, Matlab, C++ (for NS-3)
- **Python Libraries:** TensorFlow, PyTorch, Nvidia Sionna
- **Natural Languages:** Mandarin (native), English (proficiency), French (elementary), Cantonese (elementary)
- **Standardized Grades:** IELTS 8.0 (L9/R8.5/W7.5/ S7.5, in 2023), GRE 328 + 4 (V161/Q167/W4.0, in 2019)

References

1. **Dr. Xudong Wang**
   John Wu and Jane Sun Chair Professor, UM-SJTU Joint Institute, Shanghai Jiao Tong University
   Email: wxudong@sjtu.edu.cn (*Relationship: Ph.D. Supervisor*)
2. **Dr. Geoffrey Ye Li**
   Chair Professor, EEE, Imperial College London
   Email: geoffrey.li@imperial.ac.uk (*Relationship: Ph.D. Co-supervisor*)