Dingjia Lin

dingjia.lin@ieee.org UK: +44(0)7535666763
https://dingjia-lin.github.io/ Dingjia Lin Dingjia Lin Dingjia Lin

Education

PhD **University of Manchester, UK** 03/2021 – 01/2025
- Supervisor: Prof. Zhiguo Ding (FIEEE)
- Department of Electrical and Electronic Engineering
- Graduation Thesis: The Application of Optimization Techniques in Back-Com NOMA Networks. Link

MSC **University of Southampton, UK** 09/2019 – 12/2020
- School of Electronics and Computer Science
- Mobile Communication and Smart Networking

MSC **University of Sheffield, UK** 09/2017 – 12/2018
- Department of Electronic and Electrical Engineering
- Electrical and Electronic Engineering

BEng **Chongqing University of Posts and Telecommunications, China** 09/2013 – 06/2017
- College of Communication and Information Engineering
- Communication Engineering

Experience

King's College London, Research Associate — London, UK
Oct. 2024 – Apr. 2025
- Conducted research on optimization techniques for edge computing in cell-free and massive MIMO networks. (Supervisor: Prof. Toktam Mahmoodi (SMIEEE))

University of Manchester, General Teaching Assistant — Manchester, UK
Sept. 2021 – Jan. 2025
- Assisted in delivering tutorials, marking coursework, and supporting students in undergraduate-level and postgraduate-level modules.

Project

Latency/Power Optimization in Cell-free Massive MIMO MEC System (Postdoctoral Project at Kings College London) Oct. 2024 – Apr. 2025
- Research scope: Developed a cell-free massive MIMO MEC system integrating coordinated multi-point (CoMP) transmission and user-specific resource allocation.
- Challenges addressed: Minimized maximum task latency under individual power limits and total power consumption under latency constraints.
- Techniques used: Formulated joint latency and power optimization problems and solved them using a low-complexity successive convex approximation (SCA) algorithm.
- Key contributions: Demonstrated that the proposed CoMP-enabled architecture outperforms traditional massive MIMO and cell-free MIMO in both latency and power efficiency.

The Application of Optimization Techniques in BackCom NOMA Networks (PhD Project at University of Manchester) Sept. 2021 – Jan. 2025
- Research scope: Modeled and optimized BackCom-NOMA systems for uplink/downlink performance or energy efficiency across single- and multi-cell scenarios.
- Challenges addressed: Tackled joint beamforming and reflection design, BS-device association, energy efficiency under imperfect CSI, and outage reduction.

- Techniques used: Applied SDR, Dinkelbach, SCA, matching theory, S-procedure, and Bernstein inequality.
- Key contributions: Published four journal papers with novel frameworks and low-complexity algorithms for robust BackCom-NOMA deployment.

Research Interests

- Pinching Antenna System
- Cell-Free
- Edge Computing
- Cognitive Radio
- Massive MIMO
- Matching Theory
- Near-Far Field
- Non-Terrestrial Networks (NTN)
- Integrated Sensing and Communications (ISAC)
- Non-Orthogonal Multiple Access (NOMA)
- Fluid Antenna System (FAS)
- Backscatter Communication (BackCom)
- Visible Light Communication (VLC)
- Reconfigurable Intelligent Surfaces (RIS)
- Convex/Non-Convex Optimization

Publications

[J4] EE Maximization with Imperfect CSI at Transmitter in BackCom NOMA System Apr 2025

Dingjia Lin, Suhaib M. Al-Basit, Kaidi Wang, Zhiguo Ding

in IEEE Transactions on Vehicular Technology, vol. 74, no. 8, pp. 12727-12739, Aug. 2025,

doi: 10.1109/TVT.2025.3557244

- Developed a robust optimization framework incorporating CSI uncertainty, solved via Dinkelbach, S-procedure, and SROCR techniques.

[J3] Energy-Efficiency Maximization in Backscatter Communication Based Non-Orthogonal Multiple Access System: Dinkelbach and Successive Convex Approximation Approaches Aug 2024

Dingjia Lin, Tianqi Wang, Kaidi Wang, Zhiguo Ding

in IET Signal Processing, 2024, 4107801, 12 pages

doi: 10.1049/2024/4107801

- Jointly optimized beamforming and reflection coefficients under different decoding strategies using Dinkelbach and SCA algorithms to improve energy efficiency.

[C1] Uplink Data Rate Maximization with Channel Uncertainties in BackCom NOMA System Jul 2024

Dingjia Lin, Suhaib M. Al-Basit, Kaidi Wang, Zhiguo Ding

2024 International Symposium on Wireless Communication Systems (ISWCS), Rio de Janeiro, Brazil, 2024, pp. 1-6

doi: 10.1109/ISWCS61526.2024.10639114

- Optimized sum uplink rate under AP-side CSI uncertainty using S-procedure and SDR, solved via alternating optimization.

[J2] Uplink Data Rate Maximization in Multi-Cell BackCom NOMA Systems Jan 2024

Dingjia Lin, Kaidi Wang, Tianqi Wang, Zhiguo Ding

in IEEE Open Journal of the Communications Society, vol. 5, pp. 526-539, 2024

doi: 10.1109/OJCOMS.2023.3349277

- Addressed BS-BD association and reflection optimization using matching theory and iterative algorithms to enhance sum-rate and reduce outage.

[J1] Beamforming Design for BackCom Assisted NOMA Systems May 2023

Dingjia Lin, Kanapathippillai Cumanan, Zhiguo Ding

in IEEE Wireless Communications Letters, vol. 12, no. 9, pp. 1494-1498, Sept. 2023

doi: 10.1109/LWC.2023.3279668

- Proposed an uplink rate maximization framework with downlink QoS guarantees in BackCom-NOMA systems using semidefinite relaxation (SDR).

Publications (Submitted and in Preparation)

[P2] Cell-Free Networks Versus Massive MIMO: Optimizing Power Efficiency and Task Offloading Submitted

Dingjia Lin, Stefano Buzzi, Toktam Mahmoodi

- Designed a CoMP-enabled cell-free massive MIMO MEC system and minimized latency and power via a low-complexity SCA-based optimization scheme.

[P1] Latency Minimization in Cell-Free Pinching Antenna Systems in Preparation

Dingjia Lin, Zhiguo Ding

Peer Reviewer

- IEEE Transactions on Communications (IEEE TCOM)
- IEEE Transactions on Vehicular Technology (IEEE TVT)
- Annals of Telecommunications
- IEEE International Symposium on Wireless Communication Systems (ISWCS 2024)

Additional Skills

IT Skills: Python, MATLAB, LaTeX, MS Office, Photoshop, Lightroom.

Languages: English – fluent, Chinese – native.

Interests: Photography; Reading; Astronomical Observation; Writing

Referee

Prof. Toktam Mahmoodi: Department of Engineering, Faculty of Natural, Mathematical & Engineering Sciences, King's College London, London, WC2R 2LS, UK. Email: toktam.mahmoodi@kcl.ac.uk

Prof. Zhiguo Ding: School of Electrical and Electronic Engineering, The University of Manchester, Manchester, M13 9PL, UK. Email: zhiguo.ding@manchester.ac.uk

Prof. Mohammed El-Hajjar: School of Electronics and Computer Science, Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, SO17 1BJ, UK. Email: meh@ecs.soton.ac.uk