Ce ZHENG

PERSONAL DATA

Place of Birth: Shandong, China
Date of Birth: 15/10/1991
Affiliation: Pengcheng Lab
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WORKING EXPERIENCE

Department of Network Intelligent, Pengcheng Lab, China 09/2024 - now
Assitant Professor

LTCI, Télécom Paris, France 07/2023 - 09/2024
Postdoctoral Researcher

R&D Center, Sony (China) Limited, China 08/2021 - 06/2023
Wireless Researcher/ Research Scientist,
3GPP SA2 Sony Delegate (from May 2022)
Research and Development Center, Beijing, SONY

IEMN-CNRS, France 10/2017 - 10/2020
Research PhD student,
Laboratory: IRCICA - Research Institute on software and hardware devices for information and Advanced communication - USR 3380 du CNRS, Lille, France

Ph.D. THESIS

"Impulsive and Dependent Interference Modeling in IoT Networks", funded by AR-Burst

EDUCATION

University of Lille, France, 10/2017 - 03/2021
Ph.D. in Wireless Communication,
School of Micro and nano technologies, acoustics and telecommunications
Supervisor: **Laurent CLAVIER, Malcolm EGAN, Jean-Marie GORCE**

Aalborg University, Denmark, 09/2019 - 12/2019
Visiting Ph.D. Guest,
Department of Electronics
Host Professors: **Troels PEDERSEN, Petar POPOVSKI (IEEE Fellow)**

Xi'an Jiaotong University, China, 09/2013 - 07/2016
M.E in Electronics and Communication Engineering,
School of Electronics and Information Engineering
Supervisor: **Xinmin LUO**

Harbin Institute of Technology, 09/2009 - 07/2013
B.E in Communication Engineering,
School of Electronics and Information Engineering

SUMMER & WINTER SCHOOLS

CITIlab, INSA Lyon , University of Lyon, France, 18/11/2018 - 22/11/2018
1st Winter School on Information Theory and Signal Processing for Internet of Things

University of Tokushima, Japan, 07/2014 - 08/2014
The Electrical and Information Science Course Program

University of California Los Angeles, USA, 02/2014 - 03/2014
American Language Center Intensive English Communication Program

HONORS &AWARDS

Mobility Grant, 09/2019 - 12/2019
Support of visit to Aalborg University in Denmark,
University of Lille, France

IRACON 5th TS Grant, 12/2019
Training schools held in Lyon,
The Inclusive Radio Communications (IRACON)

Graduate Scholarship, 2013 - 2016
Second Class National Award (waiver of tuition and monthly living stipend),
Xi'an Jiaotong University China,

PUBLICATIONS **Journal Papers:**

[J7]. Jiahong Ning, Tingting Yang, **Ce ZHENG***, Xinghan Wang, Ping Feng, Xiufeng Zhang. "DeAOff: Dependence-Aware Offloading of Decoder-Based Generative Models for Edge Computing", China Communication, 2025.

[J6]. He, Hongliang, Xingmei Li, and **Ce Zheng**. "Secure Transmission Via Constellation Splitting", IEEE Communications Letters (2025).

[J5]. Zhou, Jie, Shuaishuai Guo, Jia Ye, Peng Zhang, and **Ce Zheng**. "Maximal Coding Rate Reduction: A Unified Approach for Task-Oriented RIS and Communication". IEEE Transactions on Vehicular Technology (2024).

[J4]. Zhang, Yarui, Shanshan Wang, Wassim Ben Chikha, Jiang Liu, **Ce Zheng**, Theodoros Samaras, and Joe Wiart. "Statistical Analysis of RF-EMF Exposure Induced by Cellular Wireless Networks in Public Transportation Facilities of the Paris Region", IEEE Access (2024).

[J3]. Ce Zheng, Malcolm Egan, Laurent Clavier, Gareth W. Peters, Jean-Marie Gorce, "On the interference arising from random spatial fields of interferers utilizing multiple subcarriers", *In: EURASIP Journal on Wireless Communications and Networking. 2022 ; Vol. 2022.*

[J2]. Ce Zheng, Malcolm Egan, Laurent Clavier, Petar Popovski, Anders Ellersgaard Kalør, "Stochastic Resource Optimization of Random Access for Transmitters with Correlated Activation", *In 2021 IEEE Communication Letters*

[J1]. Egan Malcolm, Laurent Clavier, **Ce Zheng**, Mauro De Freitas, Jean-Marie Gorce. "Dynamic interference for uplink SCMA in large-scale wireless networks without coordination" *EURASIP Journal on Wireless Communications and Networking* 2018, no. 1 (2018): 213.

Conference Papers:

[C12]. Ce Zheng, Tingting Yang. ""Communication-Efficient Collaborative LLM Inference via Distributed Speculative Decoding", In IEEE Seventeenth International Conference on Wireless Communications and Signal Processing, Oct. 23-25, 2025.

[C11]. Jiahong Ning, **Ce Zheng***, Tingting Yang. ""DSSD:Efficient Edge-Device Deployment and Collaborative Inference via Distributed Split Speculative Decoding", ICML 2025 workshop on Machine Learning for Wireless Communication and Networks.

[C10]. Ning, Jiahong, Pengyan Zhu, Ce Zheng, Gary Lee, Sumei Sun, and Tingting Yang. "EdgePrompt: A Distributed Key-Value Inference Framework for LLMs in 6G Networks." INFOCOM Workshop on Pervasive Network Intelligence for 6G Networks (2025).

[C9]. Chen Sun, Shiyao Ma, **Ce Zheng**, Songtao Wu, Tao Cui, Wenqi Zhang. "Federated Learning with CSMA based User Selection for IoT Applications". *In ICC 2024 - IEEE International Conference on Communications (ICC),* Denver, US, 2024.

[C8]. Yunda Li, Le Zhao, Chen Sun, Haojin Li, **Ce Zheng**, "An Iterative Joint Tx-Rx Hybrid Beamforming Method for Vehicular Networks", In 2023 IEEE 98th Vehicular Technology Conference (VTC2023-Fall), 1-6

[C7]. Qiong Liu, Chenhao Wang, **Ce Zheng**, "Distributed Decisions on Optimal Load Balancing in Loss Networks", *In 21st International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt),* Singapore, Singapore, 2023, pp. 464-471

[C6]. Tianming Zang, **Ce Zheng***, Wei Chen, Shiyao Ma, Chen Sun, "A General Solution for Straggler Effect and Unreliable Communication in Federated Learning", *In ICC 2023 - IEEE International Conference on Communications (ICC),* Rome, Italy, 2023, pp. 1194-1199

[C5]. Ce Zheng, Malcolm Egan, Laurent Clavier, Petar Popovski, Anders Ellersgaard Kalør, "Stochastic Resource Allocation for Outage Minimization in Random Access with Correlated Activation", *In 2022 IEEE Wireless Communications and Networking Conference (WCNC).* (pp. 1-6), Austin, US

[C4]. Ce Zheng, Malcolm Egan, Laurent Clavier, Troels Pedersen and Jean-Marie Gorce. "Linear Combining in Dependent α-Stable Interference", *In 2020 IEEE International Conference on Communications (ICC)* (pp. 1-6), Dublin, Ireland.

[C3]. Ce Zheng, Egan Malcolm, Laurent Clavier, Gareth W. Peters, Gorce, Jean-Marie. "On the Validity of Isotropic Complex α-Stable Interference Models for Interference in the IoT" *In 2019 GRETSI, Groupe d'Etudes du Traitement du Signal et des Images.*

[C2]. Ce Zheng, Egan Malcolm, Laurent Clavier, Gareth W. Peters, Gorce, Jean-Marie. "Copula-Based Interference Models for IoT Wireless Networks" *In 2019 IEEE International Conference on Communications (ICC)* (pp. 1-6), Shanghai, China.

[C1]. Ce Zheng, Jiancun Fan, and Xinmin Luo. "Spectrum and energy efficiency

analysis of ultra dense network with sleep." *2016 8th IEEE International Conference on Communication Software and Networks (ICCSN*).

PATENTS

[P9]. Ce Zheng, Chen Sun. "A user selection and resource allocation method for hierarchical tree-structure federated learning".
- Publication No: CN118945862A
- Application No: CN202310513237.9
- PCT Application No: PCT/CN2024/091318

[P8]. Ce Zheng, Chen Sun. "A performance improvement and UE selection scheme based on sidelink enhancement in federated learning".
- Publication No: CN118828625A
- Application No: CN202310436139.X
- PCT Application No: PCT/CN2024/087946

[P7]. Ce Zheng, Chen Sun. "A Split Learning (Model Splitting) Aided Federated Learning (SL-aided FL) Network".
- Publication No: CN118734897A
- Application No:CN202310342408.6
- PCT Application No: PCT/CN2024/083483

[P6]. Ce Zheng, Chen Sun. "A Sidelink-enhanced Scheme for UE Selection, UE Performing Order Selection, and Model Transmission Link Selection in Split Learning".
- Publication No: CN118473556A
- Application No: CN202310116586.7
- PCT Application No: PCT/CN2023/099329

[P5]. Ce Zheng, Chen Sun. "A Service Guarantee Scheme in Federated Learning (FL) Network".
- Publication No: CN117917907A
- Application No: CN202211286543.5
- PCT Application No: WO2024/083034 20250410

[P4]. Ce Zheng, Chen Sun. "Handover in Hierarchical Federated Learning Network".
- Publication No: CN117560722A
- Application No: CN202210936728.X
- PCT Publication No: WO2024/027676 20250126
- PCT Application No: PCT/CN2023/110473 20230801

[P3]. Wei Chen, Yuanrui Liu, **Ce Zheng**, Chen Sun. "Sidelink-Enhanced Model Splitting and Transmission Scheme between AI/ML Endpoints".
- Publication No: CN118102475A
- Application No: CN202211502760.3
- PCT Application No: PCT/CN2023/133909

[P2]. Wei Chen, Junjie Wu, **Ce Zheng**, Chen Sun. "Federated Learning in V2X Communications for Side-link Enhancement".
- Publication No: CN117454952A
- Application No: CN202210809772.4
- PCT Publication No: WO2023/226882 20241119
- PCT Application No: PCT/CN2023/095209 20230519

[P1]. Wei Chen, Zhanyuan Xie, **Ce Zheng**, Chen Sun. "A Scheme to Ensure Service Continuity During Handover between Vehicle Mounted Relays—Users Outside the Vehicle".

- Publication No: CN117177209A
- Application No: CN202210582464.2
- PCT Publication No: WO2024/012319 20250102
- PCT Application No:PCT/CN2023/105811 20230705

SEMINARS & PRESENTATIONS

Rome (29/05/2023), *A General Solution for Straggler Effect and Unreliable Communication in Federated Learning*, IEEE International Conference on Communications

Online (11/04/2022), *Stochastic Resource Allocation for Outage Minimization in Random Access with Correlated Activation*, IEEE Wireless Communications and Networking Conference

Online (30/11/2021), *Choosing a proper starting point in SGD by exploiting dependence between features — an intuition from resource allocation in event triggered communication*, Sony AI Conference, SONY

Online (22/05/2020), *Linear Combining in Dependent α-Stable Interference*, IEEE International Conference on Communications

AALBORG (13/11/2019 and 27/11/2019), *Copula Theory in Communication Society*, invited talk and hosted by Professor Petar POPOVSKI and Professor Troels PEDERSEN, Department of Electronics, Aalborg University, Aalborg, Denmark

AALBORG (30/09/2019 and 03/10/2019), *Modeling Impulsiveness and Dependence of Interference in Wireless Communication Network*, invited talk and hosted by Professor Troels PEDERSEN and Professor Petar POPOVSKI, Department of Electronics, Aalborg University, Aalborg, Denmark

GUANGZHOU (30/05/2019), *Interference Modeling for Wireless IoT Networks*, invited talk and hosted by Professor Li CHEN and Dr. Ting-yi Wu, School of Electronics and Communication Engineering, Sun Yat-sen University, Guangzhou, China

Shanghai (10/06/2019), *Copula-Based Interference Models for IoT Wireless Networks*, IEEE International Conference on Communications

RENNES (06/03/2019), *Modeling Interference with α-stable and Copulas*, ARBurst Project meeting, ITER Lab, Rennes, France

LYON (11/10/2018), *Modeling of Dependence in Impulsive Interference and Copula Theory*, ARBurst Project meeting, CITI-lab, Lyon, France

LILLE (12/06/2018), *Dependent Impulsive Interference modeling*, Seminar on 'Mathematics and IoT', IRCICA Lab, Lille, France

RENNES (14/02/2018), *Copula Theory and Dependence in Interference*, ARBurst Project meeting, ITER Lab, Rennes, France

RESEARCH & PROJECT EXPERIENCE

SEAWave and GOLIAT now

Monitor radiofrequency electromagnetic fields (RF-EMF) exposure, particularly from 5G, provide novel insights into its potential causal health effects.
SEAWave is funded by **Horizon Europe** and SERI (Switzerland);
GOLIAT is funded by **Horizon Europe research and Innovation program**.

SONY and Tai'shan Medical Center Coresearch Project 2023
Responsibility: Collaboration with medical staffs from Tai'shan Medical Center on wireless sensing technologies for vital signs (e.g. heartbeat and breath), elderly fall, device-free activity recognition, etc.

SONY and Tsinghua Coresearch Project (450,000 RMB) 2023
Responsibility: Supervise 6 Ph.D student in Tsinghua University and output 4 patents for 3GPP standards.

SONY and Tsinghua Coresearch Project (600,000 RMB) 2022
Responsibility: Supervise 6 Ph.D student in Tsinghua University and output 4 patents for 3GPP standards.

SONY and Tsinghua Coresearch Project (600,000 RMB) 2021
Responsibility: Supervise 6 Ph.D student in Tsinghua University and output 3 patents for 3GPP standards .

Impact of impulsive and dependent interference on radio communications (fully funded by ANR project ARBurst in collaboration with INSA/CITI Lyon, INSA/IETR Rennes and IRCICA Lille.) 10/2017 - 06/2021
Responsibility: - Model interference and essentially the dependent and impulsive case. Capacity has to be revisited under the impact of dependence on capacity. Other metrics will be necessary for the bursty communications and lead to multi-object optimization.

TEACHING EXPERIENCE

Teaching Assistant
INFT 3037 Stochastic Signal Analysis 09/2014 - 01/2015
INFT 3036 Communication Principals 02/2014 - 07/2014

RESEARCH SKILLS

Matlab, Python, Pytorch, Pandas, Latex, Stochastic Geometry, Copula Theory, α-stable, Markov Decision Process, Federated Learning, AI, 3GPP

Laguages

Mandarin (Native)
English (Proficiency)
French (Beginner)
Japanese(Beginner)

Research and Skills Related to LLM

Certificate

Generative AI for Everyone on Coursera 01/2024

In this course, I learned:

1. What generative AI is and how it works, its common use cases, and what this technology can and cannot do.
2. How to think through the lifecycle of a generative AI project, from conception to launch, including how to build effective prompts.
3. The potential opportunities and risks that generative AI technologies present to individuals, businesses, and society.

This will be helpful for the implementation of LLMs.

Patent

Ce Zheng, Chen Sun. "A performance improvement and UE selection scheme based on sidelink enhancement in federated learning". Application No: 202310436139.X

In this patent, we introduced a new solution to the unreliable communication problem in distributed learning network. The bottleneck of uplink transmission is mitigated by exploiting the D2D or sidelink communication. Combing with gradient coding or coded computation, this may enhance the training performance of distributed learning network, especially for the case of on-device LLM.

This will be helpful for the deployment of LLMs on devices.

Project

SEAWave Scientific-Based Exposure and Risk Assessment of Radiofrequency and mm-Wave Systems from children to elderly (5G and Beyond).

This project mains focuses on the data processing and analysis of the Electromagnetic-Field (EMF) exposure data: data collection, data cleaning, data integration, data transformation, data reduction, data sampling, data modeling, data interpretation, data exploration and visualisation, etc. The work is main done using Python library — Pandas.

This will be helpful for the data preprocessing of LLMs.

INDUSTRIAL CONTRIBUTION

The experience of editing and writing technical documents and white papers:

1. The 3rd Generation Partnership Project (3GPP) Tdoc:
SA2 152#E: S2-2206122 — Solution for KI#4 & KI#7: 5GS Assistance to Federated Learning Operation (Handover in Hierarchical Federated Learning)
2. China Communication Standardization Association (CCSA) White paper:
Research on the next generation of wireless communication and network architecture towards native AI, Chapter 6.2.1.

This will be helpful for enhancing the performance and usefulness of Large Language Models (LLMs) in standardization.