# Ce ZHENG


**PERSONAL DATA**

Place of Birth: Shandong, China
Date of Birth: 15/10/1991
Company: R&D Center (Beijing), SONY
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**WORKING EXPERIENCE**

***R&D Center, Sony (China) Limited***, *China*, 08/2021 - present
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**

**Ce Zheng**, Shiyao Ma, Chen Sun, "How to Use Machine Learning to Aide Federated Learning: Exploiting Metadata in UE Selection", *In 2023 IEEE Communication Letters* (To be submitted)

Qiong Liu, Chenhao Wang, **Ce Zheng**, "Distributed Decisions on Optimal Load Balancing in Loss Networks", (Submitted to ICC workshop 2023)

Tianming Zang, **Ce Zheng**(corresponding author), Wei Chen, Shiyao Ma, Chen Sun, "A General Solution for Straggler Effect and Unreliable Communication in Federated Learning", *In 2023 IEEE International Conference on Communications (ICC).* (Accepted)

**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.*

**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

**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*

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

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

**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.

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.

**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**

**Ce Zheng**, Chen Sun. "A performance improvement and UE selection scheme based on sidelink enhancement in federated learning". 2023 (filing)

**Ce Zheng**, Chen Sun. "A Split Learning (Model Splitting) Aided Federated Learning (SL-aided FL) Network". 2023 (filing)

**Ce Zheng**, Chen Sun. "A Sidelink-enhanced Scheme for UE Selection, UE Performing Order Selection, and Model Transmission Link Selection in Split Learning". 2023 (filed)

Wei Chen, Yuanrui Liu, **Ce Zheng**, Chen Sun. "Sidelink-Enhanced Model Splitting and Transmission Scheme between AI/ML Endpoints". 2022 (filed)

**Ce Zheng**, Chen Sun. "A Service Guarantee Scheme in Federated Learning (FL) Network". 2022 (filed)

**Ce Zheng**, Chen Sun. "Handover in Hierarchical Federated Learning Network". 2022 (filed)

Wei Chen, Junjie Wu, **Ce Zheng**, Chen Sun. "Federated Learning in V2X Communications for Side-link Enhancement". 2022 (filed)

Wei Chen, Zhanyuan Xie, **Ce Zheng**, Chen Sun. "A Scheme to Ensure Service Continuity During Handover between Vehicle Mounted Relays—Users Outside the Vehicle". 2022 (filed)

**INDUSTRIAL CONTRIBUTIONs**

3GPP SA2 152#E: S2-2206122 — Solution for KI#4 & KI#7: 5GS Assistance to Federated Learning Operation (Handover in Hierarchical Federated Learning)

CCSA White paper: Research on the next generation of wireless communication and network architecture towards native AI, Chapter 6.2.1.

**SEMINARS & PRESENTATIONS**

**Online** (29/11/2019 and 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 $\alpha$-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 $\alpha$-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

**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** (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.

**Green Transmissions: the Tradeoff between Energy Efficiency and Spectrum Efficiency** 10/2014 - 06/2016
**Responsibility**: Study and analyze the performance of Distributed Antenna Systems focusing on the tradeoff between energy efficiency and spectrum efficiency. Both the single-user and multi-user scenarios are studied.

**High Energy Efficient Transmissions (funded by the Fundamental Research Grants for the key Universities)** 01/2014 - 12/2015
**Responsibility**: Study and design efficient MAC protocol for Ultra Dense Network. Mathematical model is proposed to improve the performance based on Stochastic Geometry.

**Research on Wireless Access Strategies based on EE and SE Optimization for 5G cellular Networks** 10/2013 - 10/2014

**Responsibility**: Familiarize myself with the literature and write a review report in energy efficient cellular networks

**TEACHING EXPERIENCE**

**Teaching Assistant**

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

**RESEARCH SKILLS**

Matlab, Latex, Stochastic Geometry, Copula Theory, $\alpha$-stable, Markov Chain, Federated Learning, NOMA, SCMA, NB-IoT, LPWAN, XR, AI, VMR, 3GPP SA1 & SA2

**Laguages**

Mandarin (Native);
English (Proficiency): TOEFL 96;
French (Beginner): A1
Japanese(Beginner)