

# SHUAI MAO

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## EDUCATION BACKGROUND

### Xi'an Jiaotong University

MEng Communication and Information System

Research Direction: Ghost Imaging

Main Courses: Antennas and Radio Wave Propagation, Multi-Antenna Techniques and Their Applications, Microwave Design and Measurement, Advanced Electromagnetic Theory

Xi'an China

Sep. 2021 - Jun. 2024

Grade: 90.57/100

### Paris-Saclay University

MEng (French Engineering Degree)

Double diploma student in CentraleSupélec

Main Courses: Information Systems and Programming, Telecommunication Systems, networks and security, Statistics and Learning, Autonomous Robotics, Optimization, Game Theory

Saclay, France

Sep. 2019 - Jun. 2024

GPA: 4.07/4.33

### Paris-Saclay University

BSc Mathematics

Dual diploma program of University of Paris XI for students in CentraleSupélec

Main Courses: Holomorphic Functions, Algebra, Fourier Analysis and Integration, Topology, Measure Theory and Probability, Differential Equation

Orsay, France

Oct. 2019 - Jun. 2020

Grade: 11.556/20

### Xi'an Jiaotong University

BEng Information Engineering

Participated in Double Degree Program in junior year

Main Courses: Advanced Mathematics, Linear Algebra and Analytic Geometry, Signals and Systems, Digital logic circuits, Analog Electronics Technique

Xi'an, China

Sep. 2017 - Jun. 2021

Grade: 91.09/100 rank: 12/164

## PUBLICATIONS

- **MAO, Shuai**, HE, Yuchen, et al. High-quality and high-diversity conditionally generative ghost imaging based on denoising diffusion probabilistic model. Optics Express. <https://doi.org/10.1364/OE.496706>
- **MAO, Shuai**, HE, Yuchen, et al. Translation-Equivalence-Based Unsupervised Ghost Imaging. IEEE International Conference of Information and Communication Technology. Accepted and oral presentation.
- ZHOU Yu, **MAO, Shuai**, et al. Fully-connected-based adaptive speckles optimization method for ghost imaging, IEEE Photonics Technology Letters. <https://doi.org/10.1109/LPT.2023.3300092>
- HE, Yuchen, **MAO, Shuai**, et al. Optimizing speckles for dynamic objects using genetic algorithm in ghost imaging. AIP Advances, 2022, vol. 12, no 9. <https://doi.org/10.1063/5.0096821>

## RESEARCH EXPERIENCE

### Ghost Imaging (Computational Optical Imaging)

Sep. 2021 - Present

Supervisor: HE Yuchen

Xi'an Jiaotong University

**Description:** Ghost imaging, also known as correlation imaging or quantum imaging, is a promising technique that utilizes the second-order correlation of light field intensity fluctuations. Its advantages include lensless imaging, robustness against interference, high resolution, and non-localization properties. Nonetheless, the trade-off between imaging quality and sampling rate poses a challenge, limiting its broader application. In my research, I designed efficient measurement speckles and developed advanced ghost imaging reconstruction algorithms, ensuring high-quality imaging results at low sampling rates.

### Responsibilities:

- Introduced the diffusion model to ghost imaging and skillfully utilized bucket signals as prior information for image distribution, leading to the creation of a novel ghost imaging reconstruction algorithm.

- Explored the translation equivalence property and successfully designed an unsupervised ghost imaging algorithm, enabling efficient image reconstruction without the need for labeled data.
- Innovatively treated measurement speckles as fully-connected layer parameters, implementing an end-to-end optimization approach for ghost imaging system optimization.
- Conducted an in-depth exploration of the intricate relationship between speckles and measurement, employing genetic algorithms to select adaptive speckles for dynamic targets.

**Project Harvest:** Ghost imaging, compressed sensing, genetic algorithm, deep learning, image denoising, medical imaging, and image superresolution.

## PROFESSIONAL EXPERIENCE

### Software Engineer Summer Intern

Meituan China

*Jun. 2023 - Aug. 2023*

#### Interface Risk Assessment:

- Spearheaded the development of an interface risk assessment system.
- Adopted Pearson correlation as the core of the security assessment model.
- Established an online-to-offline data integration process for daily risk calculations.
- Scaled the system to assess the security of over 2,000 interfaces, reducing crawler attack risks

#### Store Hot List Evaluation

- Developed RPC and HTTP interfaces for store hot list evaluation.
- Utilized CompletableFuture for asynchronous processing of Excel data streams.
- Efficiently evaluated nearly 20,000 stores.
- Introduced a secondary category field for precise store classification.

### Hardware Reliability Intern

Amazon China

*Jul. 2022 - Aug. 2022*

- Conducted a comprehensive survey of common low-power chargers available in the market and performed competitive analysis on twelve chargers from four popular brands.
- Focused on investigating product reliability by conducting in-depth research on ultrasonic welding methods, wall thickness, miniaturization techniques, capacitance clearance, and fuse characteristics of the samples. Analyzed how these aspects contribute to product reliability and ensure user safety.
- Shared research findings with the team, providing valuable insights for our company's product development. Actively contributed to driving continuous improvement and enhancing the performance of our products.

### Teaching Assistant

Digital Logic Circuit

*Feb. 2022 - Jun. 2022*

*Xi'an Jiaotong University*

- Graded coursework and offered feedback to students, facilitating understanding of digital logic concepts.
- Conducted exercise classes, addressing students' questions and providing detailed explanations for homework.
- Supervised and monitored course attendance, fostering a positive learning environment and providing support.

## SKILLS

### Languages

English (Bilingual, IELTS 7.5), French (Fluent, DELF B2)

### Programming Languages

Java, Python, Golang, MATLAB, SQL

### Software & Tools

LaTeX, Excel, Word, Powerpoint, Git, Spring, Pytorch

## HONOR AND PRIZE

Chiang Chen Scholarship(15 students in total)

*2022 and 2023*

Cyrus Tang Scholarship(40 students in total)

*2018 and 2019*

Excellent Graduate, Excellent Student of Xi'an Jiaotong University

*Jun. 2021*

Excellent Volunteer of Blood Donation Service in Xi'an Central Blood Station

*Jan. 2018*