

# Xin JIN

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🎓 **HomePage:** <https://daseinda.github.io>

## EDUCATION

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### DOUBLE-DEGREE MASTER PROGRAM(UNDER EIT DIGITAL'S SCHOLARSHIP)

**KTH Royal Institute of Technology**, *Stockholm, Sweden*

Sept. 2021 - Feb. 2024

Master Degree of **Electrical Engineering**

**Technical University of Berlin**, *Berlin, Germany*

Sept. 2021 - Feb. 2024

Master Science of **ICT Innovation**(Information and Communication Technology)

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### **Bsc. in Computer Science and Technology**

Southwestern University of Finance and Economics

Sept. 2017 - Aug. 2021

### **Bsc. in Financial Management**

Southwestern University of Finance and Economics

Sept. 2017 - Aug. 2021

### **Honors Bachelor Degree of Mathematics**

Southwestern University of Finance and Economics

Sept. 2017 - Aug. 2021

The honors math degree is given to students who achieve a National Mathematical Competition Prize, publish scientific work, and excel in advanced honors math courses. In 2021, only **8 university graduates** received this prestigious degree.

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## PUBLICATION

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***Image Dehazing with Uneven Illumination Prior by Dense Residual Channel Attention Network*** 2020

Journal: IET Image Processing (ISSN 1751-9659)

Authours:Shibai Yin, JIN Xin, Yibin Wang, Anup Basu

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## WORK EXPERIENCE

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**Applied Cryptography Research Internship**, *Germany*

June. 2023 - Dec. 2023

***Trustworthy and Applied Cryptography Lab, Huawei Munich Research Center***

*C/C++, Linear Algebra*

- Implement Intel SGX(Software Guard Extensions) and MPC(Multi-Party Computation Protocols) interfaces for a hybrid secure computing platform project, which aims at machine learning applications.
- Trust Execution Environment(TEEs) Interfaces design. Implement the low-level TEEs interfaces for Scalar, Vector and Matrix class.
- Develop LeNet, AlexNet, ResNet and Transformer in C pure implementation, hands-on linear-algebra matrix derivative equations induction. The C interfaces can execute on most kinds of servers including legacy devices, and adapt to security hardware C style libraries.

**Information System Development Trainee**, *China*

Aug. 2019 - Sep. 2019

***Hwadee Information Technology Limited Company***

*Java, SQL*

- Design and implement a web-based government information management system using Java based on Mybatis framework, including web page, secure check, communication interactions, and SQL database.
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## RESEARCH EXPERIENCE

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**Deep Learning and Image Processing, Research Assistant**

Oct. 2018 - Dec. 2020

***Southwestern University of Finance and Economics***

*Pytorch, Python Script, Linux, Git*

- Literature-review, cutting-edge methodology study, model design, data preprocessing and implementation.
- Design the dehazing model combining transformer mechanism, atmospheric scattering models, and residual global connection, to improve the image dehazing performance.
- Co-write the paper as the second author, and published on IET IMAGE Processing.

## Alzheimer's disease course prediction, Research Assistant

Feb. 2018 - Jan. 2020

*Statistic Research Center, SWUFE*

*Tensorflow, Linux Shell Script, Git*

- Implement designed entropy loss function and deep learning model, which better integrate disease course's timing characteristics; Clean and bootstrap patient DICOM data using Linux shell.
- Data Pre-processing; Designed and implemented residual neural network models with embedded new cross-entropy loss functions for disease course predict performance.

## Internet of Things and Industry 4.0, Summer School

Jul. 2022 - Aug. 2022

*Technical University of Munich(TUM) & Schneider Electric*

- Read and Understand the OPC/UA protocol doc, and design the solutions to integrate legacy devices into OPC/UA platform.
- Co-operate with group members, to design a "plug-and-play" app "Rosetta 4.0" which runs on the industries' edge devices, and translate the data into OPC/UA standard.

## Vehicle 2-X Communication and Control

Apr. 2022 - Sept. 2022

*Technical University of Berlin, Faculty IV*

*C++, omnetpp, Communication Protocol, Computer Network*

- Design a control strategy and experiment simulation to observe the effects of the V2V communication strategy on SUMO and OMNet. According to the control strategy, the right-side car would have a higher priority to pass the intersection first.
- Final Report Link: *A Vehicle-to-Vehicle intersection control without traffic lights.*

## TEACHING EXPERIENCE

### Algorithmic principles of Alpha Go, a study of deep reinforcement learning and graph

2022

*University of Cambridge(GEC), Teaching Assistant*

*Bellman Equation, Monte-Carlo Tree Search*

- Followed and took notes on the professor's lectures and answered questions during office hours.
- Teach and explain classical papers in the field of deep reinforcement learning at office hour.
- Supervise the progress and content of each student research group.

### Functions of complex variables and their application

2022

*University of Cambridge(GEC), Teaching Assistant*

*Cauchy's integral theorem, Cauchy-Riemann Equation*

- Followed and took notes on the professor's lectures and answered questions during office hours.
- Taught the derivation of the fundamental theorem of functions of complex variables, such as Conformal map, Cauchy-Riemann equation, Holomorphic function, Laplace transform, Laurent series, Cauchy integral etc.

## MASTER THESIS PROPOSAL

### Enhancing Privacy, Integrity and Security in Federated Learning

2023

*TU Berlin & KTH*

*supervised by Prof. Ming Xiao, Prof. Johan Håstad*

- In the era dominated by extensive datasets and the prevalence of deep learning, Federated Learning (FL) emerges as a crucial methodology for collaborative model training while preserving individual privacy. However, FL faces privacy challenges, particularly regarding gradients and adversarial processes. This research addresses these concerns by proposing an Efficient Secure Federated Learning Platform. Data samples are distributed using a secret-sharing scheme, with linear operations executed locally on Graphics Processing Units (GPUs). The proposed platform ensures privacy during model training, culminating in discreet gradient updates transmitted securely between edge devices and the Intel SGX.

## BACHELOR THESIS

### A BSR-CSR Dynamic Sparse Storage Method for Sparse matrix with dense submatrix acceleration

2021

*Computer Science Technology Bachelor Thesis*

*supervised by Prof. Yao Chen*

- The thesis proposes a BSR-CSR dynamic block hybrid storage approach for sparse matrices which contain dense sub-matrices. The aim is to enhance operational continuity and space efficiency during the multiplication of sparse matrices with dense sub-matrices. The key contribution lies in a heuristic method for identifying and partitioning dense sub-matrices within a sparse matrix. By strategically dividing dense sub-matrices into blocks, memory access frequency for sparse matrices is reduced. The concept of BSR dynamic partitioning matrix is introduced to minimize discontinuous access and ensure equitable allocation of shared memory length, dynamically adjusting based on the partitioning matrix size.

- As dynamic influence of earnings, news, market sentiment, monetary policy, public opinion, and collective bidding on stock prices, is challenging to study. The research selects a single focus on broken-net shares, particularly in the A-share market, renowned for its susceptibility to net-value breakdowns compared to global markets. By investigating common traits and guidelines in historical data fundamentals, the study emphasizes the examination of price-to-book ratios below 1 for stock selection. The analysis delves into the rationality, stability, and fair expectations of long-term profitability, utilizing data from 3,727 A-share mainland stocks.

## MATHEMATICS MODELING COMPETITION

### China Undergraduate Mathematical Competition in Modeling(CUMCM)

2019

#### *National Second Prize, China Society for Industrial and Applied Mathematics*

- Research on physical system of **“Work Together”**.
- Leader, plan, control the process of problem-solving, distribute tasks, organize the co-operation within the team, and decide the important steps such as apply which mathematical methodologies.
- Learn physical theory and mathematical differential equations dynamics modeling, such as rigid body dynamics and the Euler angle coordinate system, and implement the simulation of concentric ball game under a discrete iteration integral scheme.
- Designed the model, built model assumptions, mathematical inductions, implemented algorithms and co-write the article.

### Asia and Pacific Mathematical Contest in Modeling (APMCM)

2019

#### *Third Prize, Team Leader*

- **The Linear Model Using AHP-FCE Method For Economic Vitality.**
- Developed and applied a regional economic dynamics evaluation index system.
- Literature review, Algorithm design, Programming and wrote the article

## HONORS & AWARD

2021	<b>ACM Chengdu Outstanding Undergraduate Nomination(One of the two recommended places at each Chinese University)</b>
2020	<b>Third Prize</b> , National University Mathematics Competition
2020	<b>Distinction Certificate in Mathematics Honors Program</b>
2019	<b>Third-Class Academic Scholarship</b>
2018-2020	<b>Scholarship for Scientific Research and Innovation (four times)</b>
2017-2018	<b>Sport Scholarship(twice)</b>

## SKILLS

### Languages:

English(Advanced), Germany(Beginner), Chinese(native), Cantonese(native)

Germany mathematical coursework when at Berlin: [Link](#)

### Computer Technologies & Tools:

C/C++, Socket, Python, Java, script, Git, Linux, Docker, Matlab, Cuda, Vscope, Vim

### Music:

Composition, Piano, Chinese Flute, Violin, Guitar.