

Zheng Xinran

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Beijing, China

EDUCATION

Tsinghua University - Master of Electronic and Communication Engineering Sep 2020 - Jul 2023
GPA: 3.90/4.00; Rank: 1/82; Key Courses: Machine Learning, Cryptography & Network Security

SiChuan University - Bachelor of Electronic Information Engineering Sep 2016 - Jul 2020
GPA: 3.75/4.00; Rank: 1/79; Dissertation: Image quality assessment (IQA) algorithms

PUBLICATIONS

- **X Zheng**, S Yang, and X Wang, SF-IDS: An Imbalanced Semi-Supervised Learning Framework for Fine-grained Intrusion Detection. *IEEE International Conference on Communications (ICC 2023)*.
- **X Zheng**, S Yang, and X Wang, A Reliable and Decentralized Trust Management Model for Fog Computing in Industrial IoT. *IEEE/IFIP Network Operations and Management Symposium (NOMS 2023)*.
- S Yang*, **X Zheng***, and X Wang, IBA: A secure and efficient device-to-device interaction-based authentication scheme for Internet of Things. *Computer Communications*.
- S Yang, **X Zheng**, and X Wang, A Lightweight Approach for Network Intrusion Detection based on Self-Knowledge Distillation. *IEEE International Conference on Communications (ICC 2023)*.

PATENTS

- Xingjun Wang, **Xinran Zheng**, et al. Methods, devices and electronic devices for securing IoT data interactions, 2022.
- Xingjun Wang, **Xinran Zheng**, et al. Training and detection methods for fine-grained network intrusion detection, 2023.

RESEARCH EXPERIENCE

IDEA(International Digital Economy Academy) - Privacy Computing Algorithm Intern Dec 2022 - Present

- Focus on full homomorphism encryption(FHE) based privacy computing applications, using bit-wise and word-wise schemes and their switching to implement the fusion of non-polynomial and polynomial cryptographic computing for privacy database query.
- Realize a large bit-width privacy data query-multiplication scheme based on CKKS scheme

The University of Hong Kong Shenzhen Research Institute - Research Assistant Sep 2022 - Dec 2022

- Focus on two-round Schnorr multi-signatures and their lattice-based migration. Understand the process of simulation-based security proof and lattice-based security assumptions

COMPETITIONS

SDG Open Hack@Tsinghua University - Award for Technical Innovation Team Dec 2022

- Propose an AI and genomics-based solution for early screening and tracking of liver cancer patients, empowering precision medicine. This work is supported by GENETRON HEALTH, INC

18th National Postgraduate Mathematical Modelling Competition - National First Prize Dec 2021

- Solved the UWB indoor precise localization problem under NLOS error. Used ensemble learning, Kalman filter, and Chan algorithm to achieve TOA localization and trajectory reconstruction. The positioning error is less than 5cm, ranking Top 1.164% among the first prize

Financial loan default prediction (Ali 'Tianchi' competition) - Top 1% Jan 2021

- Conducted cleaning and feature engineering on 47 personal credit features and used a fusion model containing XGBoost, LightGBM, and CatBoost to predict personal loan defaults. The final AUC reached 0.7460, ranking Top 1%

HONORS & AWARDS

National First Prize in the National Postgraduate Mathematical Modelling Competition. (Top 0.1%) Dec 2021

Second Prize Scholarship (Top 5%), Tsinghua University Oct 2021

Outstanding graduate, Outstanding Student, Sichuan University Jul 2020

National Second Prize in National Undergraduate Electronic Design Contest (Top 5%) Oct 2019

First Prize in Provincial Student Smart Car Competition, Electromagnetic tracing category (Top 3%) Aug 2019

LEADERSHIP & VOLUNTEERING

- Initiator of Tsinghua SIGS Big Data and Artificial Intelligence Association.
- Teaching assistants of *Big Data & Machine Learning* and *Cryptography & Network Security* at Tsinghua University.
- Volunteer Teacher at Nei Mongol Sonid Right Banner Comprehensive High School.

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https://mercuryzxr.github.io/zhengxinran.github.io/Zheng%20Xinran_CV.pdf

Dear Dr Philipp Jovanovic:

I appreciate that you can take time off your busy schedule to read my motivational letter. My name is Xinran Zheng, and I am currently studying for my master's degree in Electronics Information at Tsinghua University and expected to obtain the degree by July 2023. My past research and internship experiences have given me a deep research interest in the field of cyber security and privacy-preserving and hope to join the UCL in the fall of 2023 to pursue my PhD.

First, I have a good academic background, research and practical experience related to machine learning, information security and mathematics, which will help me to adapt to the research work as soon as possible. I have been **ranked first in both undergraduate (3.75/4.0) and graduate (3.90/4.0).** During my undergraduate studies at Sichuan University (SCU, one of the top 15 universities in China), **I was a member of an honors college** that aimed to train a group of exceptional and innovative researchers. I focused on the development of professional skills and the study of software and hardware development. I received full GPAs in most of my major courses and passed my math courses with good grades. In addition, I studied and researched at SCU Electronic Technology Lab for 2 years and won the second national prize (top 5%) in the National Student Electronic Design Competition, and the first prize (top 1%) in the Provincial Smart Car Design Competition. In my third year of undergraduate study, I was recommended to become a master in Tsinghua University. During my master's degree, I majored in Machine Learning, Cryptography & Network Security, and Big Data Analytics, and served as a teaching assistant for the first two courses. My main research focus is on the interaction security of network devices, including authentication, trust management, and intrusion detection. Based on these works, **I have published one SCI journal paper and three conference papers in network related fields as first author and co-author.** Moreover, I hope to develop my math skills. In 2021, I **won the national first prize (top 1%) in the National Graduate Student Mathematical Modeling Competition, ranking in the top 5 among the first prize winners.**

Secondly, I have a highly self-driven spirit and a passion for learning. During my research, I became interested in the problem of privacy preservation, as this would replace to some extent the presence of trust in multi-party interactions. I am currently working as a privacy computing algorithms intern at IDEA(International Digital Economy Academy), conducting research related to fully homomorphic schemes. My

main research work is on homomorphic-based privacy data query(PDQ) and computation. Specifically, this includes supporting more complex polynomial and non-polynomial database operations by means of scheme switching and data encoding. Our work is currently in the form of a paper being submitted. In addition, I worked as a research assistant at the Shenzhen Research Institute of the University of Hong Kong, where I mainly conducted the research related to lattice based multiple signatures, and have some understanding of security assumption and security reduction in lattices. All these work motivated me to further engage in privacy protection related research at the Ph.D.

Third, I enjoy interacting with people and seeking more opportunities to collaborate. In 2022, with several students from biomedical science and business administration, I proposed a ML+genomics-based solution for early screening and tracking of liver cancer patients based on machine learning and genomics to effectively screen patients who develop mutations in liver cancer target genes. The project won the Best Technology Innovation Award from *Tsinghua University SDG Open Hack*. In addition, I founded the Tsinghua University Big Data and Artificial Intelligence Association as one of the founders, aiming to provide with competition guidance and career planning sharing for computer-related students. Last year we outperformed 7 teams from ETH Zurich, HKU, etc. to win the Gold Award in Fintech80 Fintech Product Design Competition.

Overall, I have some experience in cyber security, privacy preserving and machine, and have a strong self-driven and learning ability. These experiences and skills are needed in the field of research on information security, so I would like to consider them as my future areas of research and work. **I sincerely hope to look forward to pursuing a PhD in the field of information security in the UCL.**

Thank you for considering my application!

Sincerely,
Xinran Zheng

TSINGHUA UNIVERSITY

ACADEMIC TRANSCRIPT

Student Name Zheng Xinran

Gender Female **Student No.** 2020214154 **Student Type** Graduate **Date of Admission** September, 2020

School/Department Tsinghua Shenzhen International Graduate School **Subject** Electronic and Information Engineering

Course Number	Course Title	Credit	Degree Course	Grade	Point	Year-Semester
60240103	Big Data Analytics (B)	3	Y	A	4.0	2020-Autumn
60680021	Introduction to Dialectics of Nature	1	Y	B+	3.6	2020-Autumn
62910031	Professional Ethics	1	Y	P	N/A	2020-Autumn
64100033	Big Data Systems (B)	3	Y	A	4.0	2020-Autumn
64200012	Academic English for Master Students	2	Y	A-	4.0	2020-Autumn
70240403	Machine Learning for big data	3	Y	A	4.0	2020-Autumn
80168162	Theory and Practice of Project Management	2	Y	P	N/A	2020-Autumn
82558001	Literature Searching and Paper Writing	1	Y	P	N/A	2020-Autumn
60510082	Start-up and Management for Hi-Tech Enterprises	2	Y	A	4.0	2021-Spring
60510202	Management and Innovation in the Era of Big Data	2	Y	A-	4.0	2021-Spring
80248033	Cryptography and network security	3	Y	B+	3.6	2021-Spring
85990091	Intelligent unmanned delivery in Meituan	1	Y	B+	3.6	2021-Autumn

Total Credits: 24.0

Degree Course GPA: 3.90

Degree Course Credits: 24

Director of Registrar's Office:

尹佳



Official Seal:

Date Printed: April 22, 2022

KEY TO TRANSCRIPT

I. COURSE NUMBERING SYSTEM

Each course number consists of 8-10 characters.

The first character indicates the course level:

0-4 or H-T, W = undergraduate courses

6-9, A-G or X-Z = graduate courses

II. CREDIT

Credit is reported in terms of semester hours, whether earned during a 16-week semester or a summer session. For 1 unit of credit, either one hour per week is allotted to lecture or discussion, or two hours per week are allotted to laboratory, while more hours are needed for preparation or subsequent reading and study.

III. THE RECORD ENDS WITH *****.

IV. DATE OF GRADUATION and DEGREE CONFERRED

For currently enrolled undergraduates, the columns of DATE OF GRADUATION and DEGREE CONFERRED are *****.

V. GRADING SYSTEMS

a) EFFECTIVE for students who matriculated in spring 2015 and after

(i) Tsinghua University converted to a LETTER GRADING SYSTEM. The table below shows the grades in detail.

(ii) Credits are given for A+, A, A-, B+, B, B-, C+, C, C-, D+, D, P and EX.

(iii) W: Withdrew.

(iv) I: Incomplete. Marked when a student's application is approved for not attending the final exam.

(v) EX: Exemption. Students receive credits for exempted courses.

Grade	Grade Points	Corresponding 100-point Range	Equivalent 100-point value*
A+	4.0	95-100	100
A			98
A-			92
B+	3.6	85-89	87
B	3.3	80-84	82
B-	3.0	77-79	78
C+	2.6	73-76	75
C	2.3	70-72	71
C-	2.0	67-69	68
D+	1.6	63-66	65
D	1.3	60-62	61
F	0	0-59	0
P	N/A	N/A	N/A
F	N/A	N/A	N/A

* For the transition period in 2015-2018 between the 100-point grading system and the letter grading system, Tsinghua has provided a corresponding average of values in the 100-point range of each grade. The equivalent 100-point value for course receiving credits corresponds to the median in the range. Students who matriculated in spring 2019 and after no longer use the equivalent 100-point value.

b) EFFECTIVE for students who matriculated prior to spring 2015

(i) 100-POINT GRADING SYSTEM: Credits are given for 60 points and above.

(ii) PASS/FAIL SYSTEM: Credits are given for PASS.

DISTINCTION (for undergraduates only): Credits are given for DISTINCTION.

(iii) REPEATED COURSES: The transcript displays only the latest result of a repeated course. Repeated courses are designated with an "Rn" code beside the final grade, where "n" indicates the number of times the course was repeated.

VI. GRADING POLICY REFORM 2015-2018

In the ten years prior to spring 2015, 30 percent of A-range grades have been given. From fall 2015, Tsinghua initiated a grading reform: A-range grades (A+, A, A-) were to account for 20 percent of the grades given in all courses. In Spring 2019, the faculty reaffirmed its commitment to fair and transparent assessment and removed its numeric target for the percent of A-range grades.

VII. GPA CALCULATION

$$GPA = \frac{\sum \text{Course Credit} * \text{Grade Point}}{\sum \text{Course Credit}}$$

GPA is shown for students who matriculated in spring 2015 and after in a 4.0 grading scale. Course grades with N/A (Not Applicable) should not be included in GPA calculation.

四川大学本科学生成绩单

OFFICIAL UNDERGRADUATE TRANSCRIPT OF SICHUAN UNIVERSITY

Name: Zheng Xinran Grade: 2016 Sex: Female
 Student ID: 2016141453010 Class: 162050202 Date of Birth: 19980930
 College: College of Electronics and Information Engineering Date Enrolled: 20160901 Nationality: China
 Major: Electronics and Information Science Date Graduated: 20200619 Year of Study: 4 years



Course	Credits	Score	Attribute	Code Description	Course	Credits	Score	Attribute	Code Description
Fall Term 2016-2017									
Linear Algebra	3.0	78	CC		University Physics (III)-1	2.0	83	CC	
Physics Experiments (III)-1	2.0	89	CC		Mechanical Graphics	2.0	87	OC	
Introduction of Information Science & Technology	1.0	90	CC		Ideological and Moral Cultivation and Legal Basis	3.0	91	CC	
Calculus -1	3.0	87	CC		The Outline of Chinese Modern History	3.0	87	CC	
Basic English Writing -1	2.0	93	CC		Spoken English	2.0	87	CC	
Physical Education-1	1.0	90	CC		C Program Design (Basic)	2.0	93	CC	
Mental Health Education	1.0	91	CC		Situation and Policy-1	0	88	CC	
Earned Credits					27.0	(Compulsory)	25.0	; GPA 3.54	(Compulsory) 3.54
Spring Term 2016-2017									
Probability Statistics	3.0	87	CC		University Physics (III)-2	2.0	92	CC	
Object-Oriented Programming	3.0	86	OC		Data Structure and Algorithm Analysis	3.5	84	CC	
The Basic Principles of Marxism	3.0	90	CC		Introduction to Life Science	3.0	91	OC	
Calculus -2	4.0	90	CC		Mao Zedong Thought and Theoretical System of Socialism with Chinese Characteristics	5.0	89	CC	
Seminar Course -1	0.5	90	CC		Basic English Writing-2	2.0	94	CC	
Physical Education-2	1.0	89	CC		Military Training	0	85	CC	
Engineering Training(III)	2.0	95	CC		Situation and Policy-2	0	86	CC	
Chinese Culture (History)	3.0	92	CC						
Earned Credits					35.0	(Compulsory)	29.0	; GPA 3.68	(Compulsory) 3.68
Fall Term 2017-2018									
Criminal Psychology	2.0	92	OC		Situation and Policy-3	0	86	CC	
Methods of Mathematical Physics	3.0	97	CC		Database and Information Management	2.0	87	OC	
Theory of Circuit	3.5	82	CC		Digital Electronic Technology (I)	3.5	91	CC	
Academic English Writing -1	2.0	95	CC		Physical Education-3	1.0	91	CC	
Graphic Design	2.0	95	OC		Circuit Theory Experiment	1.0	90	CC	
Experiment of Digital Electronic Technology(I)	2.0	93	CC		Electronics Practice	1.0	88	CC	
Western Culture (History)	2.0	93	OC						
Earned Credits					25.0	(Compulsory)	17.0	; GPA 3.87	(Compulsory) 3.84
Spring Term 2017-2018									
Situation and Policy-4	0	94	CC		Physics Experiments (III)-2	1.0	90	CC	
Signals and Systems	4.0	78	CC		Analog Electronic Technology (I)	3.5	93	CC	
Microcomputer Principle and Interface Technology	3.5	89	CC		Competition Training	1.0	95	OC	
Academic Frontiers/Innovation and Entrepreneurship Seminar	1.0	95	OC		College Students Career Development Planning	1.0	95	OC	
Seminar Course -2	0.5	90	CC		Academic English Writing-2	2.0	89	CC	
Physical Education-4	1.0	93	CC		Military Theory	2.0	95	CC	
Analog Electronic Technology Experiments (II)	2.0	94	CC						
Earned Credits					22.5	(Compulsory)	19.5	; GPA 3.75	(Compulsory) 3.71
Fall Term 2018-2019									
Situation and Policy-5	0	88	CC		Electromagnetic Field and Microwave Technology	4.5	97	CC	
Digital Signal Processing	3.0	87	CC		Random Signal Analysis	3.0	96	CC	
Communication Principle Experiment	1.0	91	CC		Microcomputer Principle and Interface Technology	1.0	91	CC	
Modern Communication Technology	4.0	97	CC		The Internet of Things:Technology and Applications	3.0	87	OC	

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Course	Credits	Score	Attribute	Code Description	Course	Credits	Score	Attribute	Code Description
Fall Term 2018-2019									
Computer Networking:A Top-Down Approach Featuring the Internet	3.0	96	CC		Lectures of Academic Special Subject	1.0	95	CC	
Music accomplishment and experience	2.0	90	OC						
				Earned Credits	25.5	(Compulsory)	20.5	; GPA 3.93	(Compulsory) 3.96
Spring Term 2018-2019									
Situation and Policy-6	0	92	CC		Science research method	2.0	83	OC	
RF Communication Circuits	3.0	93	CC		Production Practice	1.0	83	CC	
Digital Information Technology Specialty Experiment	2.0	91	CC		Antenna Theory and Design	3.0	82	CC	
Modern Electronics Technology Experiment	1.0	92	CC		Modern Communication Networks	2.0	86	OC	
Pattern Recognition and Image Processing	2.0	74	OC		RF Communication Circuit Experiment	1.0	95	OC	
Science Research Training	1.0	95	OC						
				Earned Credits	18.0	(Compulsory)	10.0	; GPA 3.59	(Compulsory) 3.72
Fall Term 2019-2020									
Situation and Policy-7	0	88	CC		Synthetic Electronic System Design	2.0	87	CC	
Education and Training of Innovation & Entrepreneurship	4.0	95	OC		Education and Training of Innovation & Entrepreneurship	4.0	95	OC	
Education and Training of Innovation & Entrepreneurship	5.0	95	OC		Education and Training of Innovation & Entrepreneurship	1.0	84	OC	
Education and Training of Innovation & Entrepreneurship	2.0	84	OC		Education and Training of Innovation & Entrepreneurship	2.0	95	OC	
Education and Training of Innovation & Entrepreneurship	2.0	95	CC						
				Earned Credits	22.0	(Compulsory)	4.0	; GPA 3.88	(Compulsory) 3.85
Spring Term 2019-2020									
Situation and Policy-8	2.0	89	CC		Graduation Thesis	10.0	83	CC	
				Earned Credits	12.0	(Compulsory)	12.0	; GPA 3.37	(Compulsory) 3.37
*****Transcript Totals*****									
Required Credits				170	; Earned Credits	187	Earned Compulsory Credits		137
GPA				3.72	; GPA of compulsory Courses	3.7			
Weighted Average Mark				89.72	; Weighted Average Mark of Compulsory Courses	89.48			
*****End of Transcript*****									