

Personal details

Personal details

First / given name Haoran
Second given name
Third given name
Surname/family name Xu
Date of birth 27 January 2002
Preferred first/given name Haoran
Previous surname
Country of birth China
Legal nationality Chinese
Dual nationality
Country of residence China
Have you previously studied with us at the University of Bristol? No

Contact details

Home address

Please provide your permanent residential address. If you have another address and would prefer for us to contact you at that address instead you have the opportunity to add a correspondence address in the next section.

Country China
Postcode 300280
Address Line 1 9-2-401,Xingang Holiday,Dagang
Address Line 2
City Tianjin
County
Telephone

If you would like us to send any postal correspondence to an address which is not your home address please enter an alternative address here. If you want us to send correspondence to your home address then please select No.

Do you want to add a correspondence address? No
Country China
Postcode 300280
Address Line 1 9-2-401,Xingang Holiday,Dagang
Address Line 2
City Tianjin
County
Telephone

Agent

Agent details

Agency Name
Email address

Other information

Additional Documents

Please upload required documents as outlined in your admissions statement

Mode of study

How would like to study this Full Time
programme?

Qualifications

Qualifications

Institution	Qualification	Type	Subject	Actual/predicted	Grade	Start date	End date
Xi'an Jiaotong-Liverpool University	First degree BA/BSC etc	Academic Qualification	Mathematics	Predicted	80	10/Sep/2020	31/Jul/2024

If these qualifications have altered since your last application please note the changes in the free text box here.

English Language

Is English your first language? No

What is your first language? Chinese

Did you study at school/university where you were taught in English? Yes

For how many years? 4

Have you sat a relevant English language test? No

TOEFL (internet-based)

Registration number

Date of TOEFL test

TOEFL reading score

TOEFL listening score

TOEFL speaking score

TOEFL writing score

TOEFL total score

IELTS (International English Language Testing System)

Test report form (TRF) number

UKVI number (if applicable)

Date of IELTS test

IELTS listening score

IELTS reading score

IELTS writing score

IELTS speaking score

IELTS total score

Pearson Test of English

Score report code

Date of Pearson test

Pearson listening score

Pearson reading score

Pearson speaking score

Pearson writing score

Pearson overall score

Other English Language test

Name of course

Registration number

Date of test

Listening score

Writing score

Reading score

Total score

Experience

Current Employer

Employer name and address China Merchants Securities Co. Ltd., Shanghai, China

Job title and main duties Quantitative Researcher Intern Predict abnormal multi-day returns by analyzing investor sentiment via Natural Language Processing (NLP) and Deep Learning with Python

Full time/Part time Part time

Date of Appointment 01 June 2022

End date (if applicable) 01 September 2022

Previous employment 1

Employer name and address

Job title and main duties

Full time/Part time

Date of Appointment

End date (if applicable)

Previous employment 2

Employer name and address

Job title and main duties

Full time/Part time

Date of Appointment

End date (if applicable)

Previous employment 3

Employer name and address

Job title and main duties

Full time/Part time

Date of Appointment

End date (if applicable)

Other Experience

Do you have any other relevant work experience to support your application? No

Please provide details

Personal statement

Personal details

Do you have a personal statement to upload? Yes
Please type your personal statement in the box

Research proposal

Research proposal

Proposed supervisor 1 Tim Dokchitser
Proposed supervisor 1
Proposed project title Application of High-Precision Numerical Methods in Data Approximation and
(max 150 chars) Financial Market Prediction

Passport and visa

Visa required

Do you require a visa to study in the UK? Yes

Please fill out your passport details below. If you are unable to provide these at the current time you will have another opportunity to upload your passport after you submit the form. If you do not provide us with this information we will be unable to issue you with your confirmation of acceptance number and you will be unable to obtain a visa.

Passport details

Passport number EL2816162

Further details

Have you previously studied in the UK? No

What was the highest level of study in the UK?

Please confirm the total length of your UK study in years

Referees

Referee 1

Do you have a reference to upload? Yes

Type of reference

Referee title

Forename

Surname

Position

Institution/Company

Email address

Country

Referee 2

Do you have a second reference to upload? Yes

Type of reference

Referee title

Forename

Surname

Position

Institution/Company

Email address

Country

Funding

Funding 1

What is your likely source of funding? Yourself/family

Please give the name of your scholarship or Studentship
Please specify

Percentage from this source 100

Is this funding already secured? Yes

Funding 2

What is your likely source of funding?

Please give the name of your scholarship or Studentship
Please specify

Percentage from this source

Is this funding already secured?

Funding 3

What is your likely source of funding?

Please give the name of your scholarship or Studentship
Please specify

Percentage from this source

Is this funding already secured?

Other funding

I would like to be considered for other funding opportunities

Documents

Document type	File name
Secured funding evidence	secured funding.pdf
References	reference letter Haoran Xu.pdf
Personal statement	Personal Statement.docx
Curriculum vitae	7_CV_Bristoldocx.pdf
Research proposal	research statement .docx
References	Reference letter(1).pdf
Transcript	Haoran Xu - Transcript.pdf

By ticking the checkbox below and submitting your completed online application form, you acknowledge the University of Bristol will use the information provided from time to time, along with any further information about you the University may hold, for the purposes set out in the [University's full Data Protection Statement](#). Applicants applying to the collaborative programmes of doctoral training should also read the [Data Protection Statement](#) for collaborative programmes of doctoral training.

The information that you provided on your application form will be used for the following purposes:

- To enable your application for entry to be considered and allow our Admissions Advisors, where applicable, to assist you through the application process;
- To enable the University to compile statistics, or to assist other organisations to do so. No statistical information will be published that would identify you personally;
- To enable the University to initiate your student record should you be offered a place at the University.

All applicants should note that the University reserves the right to make without notice changes in regulations, courses, fees etc at any time before or after a candidate's admission. Admission to the University is subject to the requirement that the candidate will comply with the University's registration procedure and will duly observe the Charter, Statutes, Ordinances and Regulations from time to time in force.

By ticking the checkbox below and submitting your completed online application form, you are confirming that the information given in this form is true, complete and accurate and that no information requested or other material information has been omitted. You are also confirming that you have read the Data Protection Statement and you confirm the statement below.

I can confirm that the information I have provided is true, complete and accurate. I accept that the information given in my application will be stored and processed by the University of Bristol, in accordance with the *UK General Data Protection Regulation and Data Protection Act 2018*, in order to:

- Consider my application and operate an effective and impartial admissions process;
- Monitor the University's applicant and student profile;
- Comply with all laws and regulations;
- Ensure the wellbeing and security of all students and staff;
- If my application is successful to form the basis of the statement made within my application.

If the University of Bristol discovers that I have made a false statement or omitted significant information from my application, for example examination results, I understand that it may have to withdraw or amend its offer or terminate my registration, according to circumstances.

Education Background

Xi'an Jiaotong-Liverpool University (XJTLU), China

09/2020 – 07/2024

BSc in Applied Mathematics | Overall GPA: 3.73/4.0 | Grade: 78% (Year2), 80% (Year 3) | Expected First Class Degree

Coursework (XJTLU): Calculus | Advanced Algebra | Probability & Mathematical Statistics | Complex Functions | Ordinary Differential Equations and Control | Discrete Mathematics & Stats | Mathematical Analysis | Ordinary Partial Differential Equations | Discrete Mathematics | Linear Algebra | Dynamic Modeling | Numerical Analysis | Partial Differential Equations

*As for the examination of MTH203 Introduction to Operational Research, I would like to provide further explanation regarding my low GPA. During the final examination of this course, unfortunately, I fell ill with a severe fever, which significantly impacted my ability to perform at my usual level.

Coursera Courses: Python for Everybody | Machine Learning

Awards and Honors

University Academic Excellence Award (Top 5%)

08/2022

University Academic Achievement Award (Top 10%)

08/2021

Work Experience

Quantitative Researcher Intern | China Merchants Securities Co. Ltd., Shanghai, China

06/2022 - 09/2022

- Predict abnormal multi-day returns by analyzing investor sentiment via Natural Language Processing (NLP) and Deep Learning with Python:
 - ✧ Collected the related news and reports from earning calls and financial statements for 50 publicly traded companies in China. Applied the Baidu Senta system to analyze the text and extract the sentiment scores
 - ✧ Combined the sentiment scores with various fundamental and technical features such as (Earning-per-share) EPS, (Return-on-Asset) ROA, (Return-on-Equity) ROE, MACD, and KDJ to predict the forward returns for 1-day, 2-day, and 5-day horizons
 - ✧ Built the Support Vector Machine (SVM) and Neural Network in Python to train the model; the SVM is tuned by grid search while the Neural Network is tuned on the layer of networks, number of neurons, and activation functions in a sequential manner
 - ✧ The results suggested the constructed feature set achieved the strongest predictive power on the horizon between the 1-day close and the 2-day close, with two prediction models achieving PnL at 56 and 54 (in bps)

Research Experience

Investigations of High-precision Numerical Methods in Data Approximation

Summer Undergraduate Research Fellowship (SURF), XJTLU

06/2023 – 08/2023

- Provided a more detailed explanation of the mechanism of the stabilization technique by using the connection of the Arnoldi process with the QR decomposition of the Vandermonde matrix
 - ✧ Learned how to leverage advanced optimization methods, including Gradient Descent, Conjugate Gradient, Newton's Method, and Stochastic Optimization, to refine machine learning models
 - ✧ Utilized Feature Selection and Dimensionality Reduction techniques, including PCA and t-SNE, and Clustering algorithms to enhance data mining processes. Achieved a streamlined data preprocessing and extraction workflow based on Python, leading to a 13% improvement in data processing speed and a 17% increase in the accuracy of data interpretation
 - ✧ Utilized the Vandermonde with Arnoldi approach to achieve stable computation of derivatives through the Krylov subspace. Leveraged the confluent Vandermonde matrix to attain a 25% improvement in the precision of polynomial approximations across various grids

Quantitative Trading Strategy Research Based on Machine Learning for A-Share Market in China

Independent Research Program, UoL

01/2023 – 03/2023

- Developed machine learning models via Python to predict the one-day close-to-close returns of stocks in China and developed a trading strategy based on the predictions with a Top-k dropout strategy:
 - ✧ Collected the price-volume data from Yahoo Finance and calculated daily close-to-close return as a prediction target. Prepared daily technical indicators, including opening/closing prices, maximal/minimal prices, trading volume/counts, and multi-day aggregated return
 - ✧ Constructed features based on the prepared technical indicators and applied z-score transformation; applied mean-imputation to handle missing values and utilized forward stepwise selections to obtain the final 139 input features
 - ✧ Built, trained and optimized LightGBM, XGBoost, Random Forest, and Neural Network models with Python. The LightGBM achieved the best performance in terms of the out-of-sample correlation between the target and prediction
 - ✧ Applied the Top-k dropout on the daily revenue prediction; the corresponding portfolios achieved annual returns at 14.48% and 16.41%, with maximum drawdowns of 6% and 5%, respectively

Readmission Risk Prediction for Patients with Respiratory Disease via Statistical Machine Learning

Independent Research Program, UoL

10/2022 – 12/2022

- Predicted the risk of readmission for respiratory disease patients in China using Logistic Regression, Decision Tree, Random

Forest, and AdaBoost models with imbalanced class handling techniques:

- ✧ Collected ~300k health records data containing 79 clinical features for patients with respiratory disease in Jiangsu Province in China from 2015-2018. The data exhibited imbalanced responses with a positive-negative ratio of 6:1
- ✧ Applied Logistic Regression (LR), Decision Tree (DT), Random Forest, and AdaBoost with Python for prediction
- ✧ Utilized and compared three techniques for handling imbalanced classes: upsampling, downsampling, and Synthetic Minority Oversampling Techniques (SMOTE). Ensembled the predictions from various models to obtain the final predictions with lower prediction variance
- ✧ Evaluated the model performance by assessing Recall, F1-score, and Area under Curve (AUC). The result showed all the subsampling methods improved AUC and F1 scores compared to methods without class imbalance adjustment. The SMOTE also improves Recall significantly
- ✧ Ranked the feature importance according to the fitted AdaBoost, and it suggests four features, including hospitalization days, days since the last admission, hospitalization costs, and age, have the most predictive power on the risk of readmission

Numerical Differential Equation Solvers via Deep Neural Networks

Summer Undergraduate Research Fellowship (SURF), XJTU

06/2022 – 08/2022

- Applied Deep Neural Networks to numerically solve high-order partial differential equations (PDEs) and studied the effect of network architecture and learning parameters:
 - ✧ Visualized the dynamics of the parameters in high-order multivariable partial differential equations trained via Convolutional Neural Networks (CNNs)
 - ✧ Studied and effects of network and learning parameters in the model.; compared different activation functions, including Sigmoid, Relu, and LeakyReLU; studied different rates of neuron dropouts
 - ✧ Implemented the numeric optimizer based on the fine-tuned architecture via MATLAB and applied it to solve high-order PDEs under different initial conditions
 - ✧ Wrote the research report and produced a poster for presentation. Presented the research work in the 2022 SURF workshop

Image Restoration via Partial Differential Equations (PDEs)

Summer Undergraduate Research Fellowship (SURF), XJTU

06/2021 – 08/2021

- Developed a high-resolution image restoration algorithm based on Perona-Malik anisotropic diffusion PDE models and designed a graphical user interface (GUI) in MATLAB:
 - ✧ Reviewed the theory of parabolic PDEs with a focus on their evolutions with time; studied the numerical algorithms to obtain the PDE solutions, specifically finite difference methods
 - ✧ Studied the formulations of Perona-Malik anisotropic diffusion PDEs and how they are applied to image restoration problems in the literature
 - ✧ Implemented the algorithm based on the numerical solutions of the nonlinear diffusion equation and applied it to blurred images to reconstruct high-resolution ones. Designed a GUI in MATLAB
 - ✧ Wrote the research report and produced a poster for presentation. Presented the research work in the 2021 SURF workshop

Projects

Diabetes Prediction With Pyspark MLLIB | Coursera

10/2022 – 11/2022

- Developed a logistic regression model using PySpark MLlib to classify diabetic and non-diabetic patients in a cloud-based environment
 - ✧ Leveraged Google Colab for project execution, installing and configuring PySpark to work with advanced data processing frameworks in a cloud-based environment
 - ✧ Conducted data cleaning and preprocessing, addressing missing values and outliers, resulting in improved model performance for classifying diabetic and non-diabetic patients
 - ✧ Developed a logistic regression model using PySpark MLlib, achieving an 87% accuracy in classifying patients as diabetic or non-diabetic based on the Pima Indian Diabetes dataset

Breast Cancer Prediction Using Machine Learning | Coursera

04/2022 – 05/2022

- Developed a machine learning model using logistic regression for breast cancer prediction, improving diagnostic capabilities for classifying cancer as malignant or benign
 - ✧ Utilized Kaggle API and Google Colab for downloading breast cancer diagnostic datasets, followed by data cleaning and preprocessing, resulting in improved model performance for classifying cancerous and noncancerous patients
 - ✧ Developed a breast cancer prediction model using machine learning with logistic regression, achieving an accuracy of 93% in classifying cancer as malignant or benign, contributing to enhanced diagnostic capabilities
 - ✧ Applied feature selection techniques and hyperparameter tuning to optimize the logistic regression model, further improving its performance and enabling more precise cancer classification

Skills

Programming: Java | Python | MATLAB | R | MySQL | LaTeX

Libraries: NumPy | pandas | matplotlib | seaborn | scikit-learn | TensorFlow | Keras | nltk | spaCy | SQLAlchemy | PyTorch

From a young age, mathematics has captivated me with its elegance and the profound truth it reveals about our world. My undergraduate journey at Xi'an Jiaotong-Liverpool University (XJTLU), majoring in Applied Mathematics, has not only solidified my passion for mathematics but also honed my analytical skills, preparing me for the challenges of research. With an overall GPA of 3.73/4.0 and anticipated first-class honors, I am now eager to delve deeper into the realm of mathematics through the Ph.D. program at the University of Bristol.

Academic Background and Achievements

Throughout my undergraduate studies, I engaged deeply with a wide range of mathematical disciplines, from Calculus and Advanced Algebra to more specialized subjects such as Numerical Analysis and Partial Differential Equations. This diverse coursework laid a solid foundation for my research interests in high-precision numerical methods and their applications in data approximation and machine learning. Despite facing an unexpected challenge during my Operational Research exam due to illness, my academic performance earned me the University Academic Excellence Award (Top 5%) and Academic Achievement Award (Top 10%), testament to my resilience and dedication.

Research Experience

My research experiences have been both broad and profound, reflecting my curiosity and commitment to contributing new knowledge. As a Quantitative Researcher Intern at China Merchants Securities Co. Ltd., I utilized NLP and deep learning to predict stock returns, achieving significant predictive power. This project not only allowed me to apply mathematical theories to solve real-world problems but also ignited my interest in the intersection of mathematics and finance.

During my time at XJTLU, I embarked on several research projects that further developed my expertise. Notably, my work on high-precision numerical methods in data approximation and machine learning-based quantitative trading strategies for the A-share market in China showcased my ability to leverage mathematical models to drive innovation and efficiency in complex systems. Additionally, my independent research on readmission risk prediction for respiratory disease patients using statistical machine learning highlighted my skills in applying mathematical concepts to improve healthcare outcomes.

Why the University of Bristol?

The University of Bristol stands out as an ideal place for my doctoral studies due to its renowned mathematics department and the cutting-edge research conducted by its faculty. I am particularly drawn to the department's focus on the application of numerical analysis and partial differential equations in solving real-world problems, which aligns perfectly with my research interests and aspirations. The opportunity to

work alongside leading scholars in my field and access to state-of-the-art facilities will provide an unparalleled environment for my academic and professional growth.

Conclusion

I am convinced that a Ph.D. in Mathematics from the University of Bristol will equip me with the advanced knowledge and research capabilities to make significant contributions to the field of mathematics and its application in solving real-world challenges. My academic background, research experience, and passion for mathematics make me a strong candidate for your program. I look forward to the opportunity to contribute to and benefit from the vibrant academic community at Bristol.

Research Title:

Application of High-Precision Numerical Methods in Data Approximation and Financial Market Prediction

Research Question:

This study aims to explore how high-precision numerical methods can enhance the accuracy of data approximation and be applied in financial market prediction to address current model deficiencies in accuracy and efficiency when processing large datasets.

Context:

Despite existing studies employing various mathematical models and machine learning methods for financial market prediction, there remains significant room for improvement in terms of data approximation accuracy and computational efficiency. Moreover, high-precision numerical methods have shown great potential in enhancing model predictive performance, especially when dealing with complex functions and large-scale datasets.

Methodology:

This research will utilize high-precision numerical methods, such as the technique combining the Arnoldi process with the QR decomposition of the Vandermonde matrix, and solving high-order partial differential equations using deep neural networks. Additionally, investor sentiment will be analyzed through Natural Language Processing (NLP) and deep learning techniques, combined with fundamental and technical features to predict financial market returns. The implementation and model training will be conducted using Python.

Potential Supervisors:

Motivation for Choosing Bristol:

The Mathematics Department at the University of Bristol, with its outstanding research background, especially in the fields of numerical analysis and financial mathematics, provides an ideal academic environment for my study. The interdisciplinary research opportunities and close ties with the financial industry at the University of Bristol will greatly facilitate the development of my research.

Relevant Experience and Skills:

Earning a Bachelor's degree in Applied Mathematics from Xi'an Jiaotong-Liverpool University has given me a solid foundation in mathematical theories. Participating in a quantitative research internship and independent research projects has not only equipped me with proficiency in programming languages such as Python and MATLAB but also skilled usage of libraries like NumPy, pandas, and TensorFlow for data analysis and building machine learning models. Furthermore, taking leading

roles in projects related to financial market prediction and medical data analysis has provided me with valuable practical foundations for conducting advanced mathematical and financial modeling research.



Statement

To whom it may concern,

Xi'an Jiaotong-Liverpool University (XJTLU) is a research-led international university, based in Suzhou, Jiangsu Province, China, founded in 2006 jointly by Xi'an Jiaotong University of China and the University of Liverpool of the United Kingdom. Xi'an Jiaotong University is one of the most prestigious universities in China, prioritized by the State of Council of China in the national 211 Project and 985 Project. The University of Liverpool, founded in 1881, is one of the UK's leading universities, renowned for its teaching and research excellence and a member of the Russell Group. As an independent Sino-Foreign cooperative university, XJTLU captures the essence of both prestigious parent universities and was the first one of this kind approved by the Ministry of Education in China.

Students of Xi'an Jiaotong-Liverpool University who complete their studies successfully receive two degrees: the degree of the University of Liverpool and the Chinese degree of XJTLU for those programmes where XJTLU has acquired degree-awarding powers.

The University offers undergraduate degree programmes in the fields of economics and management, finance, mathematics, science, engineering, languages and communication, and built environment (architecture, urban planning and civil engineering). Undergraduate students, depending on their programme, may choose to study for four years onsite at XJTLU in Suzhou, or study for two years at XJTLU in Suzhou and then transfer to the UK and study for two years at the University of Liverpool. Regardless of their study route, undergraduate students receive dual degrees.

The University also offers interdisciplinary graduate Masters programmes, which are XJTLU programmes leading to Masters Degrees at the University of Liverpool. As well, XJTLU doctoral students, co-supervised by staff at XJTLU and University of Liverpool, are enrolled in off-site PhD programmes of the University of Liverpool.

The language of teaching and assessment at Xi'an Jiaotong-Liverpool University is English. For the undergraduate programmes, in Year 1 some modules, required as part of the Chinese undergraduate degree, are offered in Chinese. As well, in Years 1 and 2 XJTLU students study credit-bearing modules in English for Academic Purposes, in a supportive environment with small-group teaching. XJTLU module specifications and transcripts are provided in English only.

The University has adopted a British marking and degree classification scheme within Chinese higher education system; 40% is the pass mark for modules in most undergraduate programmes; 50% is the pass mark for modules in most Masters programmes. Assessment procedures are subject to a rigorous quality assurance system that involves internal moderation and external examiners.

Degrees are classified or differentiated as: Undergraduate - First, Upper Second, Lower Second, Third, Pass; Masters - Distinction, Merit, Pass. The majority of XJTLU graduates have chosen to continue their academic studies abroad and many of them have been admitted by renowned universities around the world. In addition, the University offers a career development service to graduates to assist them in securing employment in their area of specialisation.

Further information regarding Xi'an Jiaotong-Liverpool University may be obtained at www.xjtlu.edu.cn.

Registry

Xi'an Jiaotong-Liverpool University

Ref. No.: Reg20150727





Xi'an Jiaotong-Liverpool University

西交利物浦大学

Academic Transcript

Student Name: Haoran Xu ID Number: 2034985 Date of Birth: 27/Jan/2002 Programme Title: Applied Mathematics
Programme Length: 4 Years Start Date: 21/Sep/2020 Expected End Date: 31/Jul/2024

Year	Period	Module	Title	Credit	Mark/Grade	Year	Period	Module	Title	Credit	Mark/Grade
Stage: 1						2021/22 SEM1	MTH113	Introduction to Probability and Statistics		5	70%
2020/21 SEM1	CCT007	Self-management		2	63%	2021/22 SEM1	MTH117	Analysis 1		5	78%
2020/21 SEM1	CCT009	Introduction to Literature and Media Culture		2	54%	2021/22 SEM2	MTH106	Introduction to the Methods of Applied Mathematics		5	96%
2020/21 SEM1	EAP027	Core English Communication and Academic Skills I		10	59%	2021/22 SEM2	MTH108	Dynamic Modelling		5	77%
2020/21 SEM1	MTH017	Linear Algebra for Mathematical Science		5	75%	2021/22 SEM2	MTH118	Analysis 2		5	74%
2020/21 SEM1	MTH029	Calculus (Mathematical Sciences)		5	57%	2021/22 SEM2	MTH122	Introduction to Abstract Algebra		5	82%
2020/21 SEM1	PHE001	Physical Education 1		1	61%			Average:		78%	
2020/21 SEM2	CCT008	Ideological and Moral Cultivation and Basis of Law		2	61%	Stage: 3					
2020/21 SEM2	CCT010	The Modernization Process of China		2	63%	2022/23 SEM1	MTH207	Vector Fields: Theory and Applications		5	82%
2020/21 SEM2	EAP020	Core English Communication and Academic Skills II		10	43%	2022/23 SEM1	MTH212	Ordinary Differential Equations and Control		5	95%
2020/21 SEM2	MTH008	Multivariable Calculus (Science and Engineering)		5	73%	2022/23 SEM1	MTH219	Complex Functions		5	83%
2020/21 SEM2	PHE002	Physical Education 2		1	60%	2022/23 SEM1	MTH229	Discrete Mathematics		5	87%
2020/21 SEM2	PHY002	Physics		5	77%	2022/23 SEM2	MTH203	Introduction to Operational Research		5	48%
				Average:	61%	2022/23 SEM2	MTH208	Numerical Analysis		5	84%
						2022/23 SEM2	MTH209	Classical Mechanics		5	77%
						2022/23 SEM2	MTH210	Partial Differential Equations		5	83%
								Average:		80%	
Stage: 2						Other Academic Achievements:					
2021/22 ACYR	EAP115	English Language and Study Skills for Mathematics		10	63%	2022/23 University Academic Achievement Award					
2021/22 SEM1	CPT105	Introduction to Programming in Java		5	91%	2022/23 Work Placement: 90 Hours					
2021/22 SEM1	MTH107	Advanced Linear Algebra		5	86%	End of Transcript					

- The language of instruction is English.
- Average = $\sum (\text{module marks} \times \text{credits}) / \sum \text{credits}$.
- The pass mark is 40% for undergraduate modules, and 50% for postgraduate modules.
- Xi'an Jiaotong-Liverpool University follows the British marking criteria:

70% to 100%	First Class
60% to 69%	Upper second class
50% to 59%	Lower second class
40% to 49%	Third class
0% to 39%	Fail



To confirm the validity of the information contained within this transcript, please contact Registry Office by email: academicservices@xjtu.edu.cn

Programme and Module

My Module List				
2023/24 Academic Year				
Module Code	Module Title	Module Type	Period Slot	Credit
MTH301	Final Year Project	Compulsory	Academic Year	10
MTH307	Population Dynamics	Optional	Semester 1	5
MTH315	Geometry of Curves and Surfaces	Optional	Semester 1	5
PHY301	Quantum Mechanics	Optional	Semester 1	5
MTH308	Mathematical Models of Solids and Fluids	Optional	Semester 2	5
MTH310	Functional Analysis	Optional	Semester 2	5
MTH318	Optimisation Theory	Optional	Semester 2	5
<div><div><div>• Students who failed to submit optional module selection by the deadline have be assigned to modules on a random basis according to the module package in programme specification.</div><div>• Please check your module list and contact timetables@xjtlu.edu.cn if any question.</div></div></div>				



在读证明

兹证明 许浩然 同学 (学号: 2034985; 身份证号/护照号: 120109200201275518) 系西交利物浦大学全日制在读本科学生, 现就读于4年级, 该生具体信息如下:

注册专业: 数学与应用数学

专业学制: 4年 (8学期)

所在院系: 数学物理学院

入学时间: 2020 年 09 月

预计毕业时间: 2024 年 07 月

Enrollment Status Letter

This is to certify that Haoran Xu (Student ID : 2034985; National ID/Passport No.:120109200201275518) is a full-time undergraduate student of Xi'an Jiaotong-Liverpool University, currently registered in Stage 4. Detailed enrollment information of the student is as below.

Degree programme: Applied Mathematics

Length of Programme: 4 Years (8 Semesters)

School: School of Mathematics and Physics

Start Date: September 2020

Expected End Date: July 2024

Registry
西交利物浦大学教务处 (签章)
Xi'an Jiaotong-Liverpool University
10/Oct/2023





中国银行
BANK OF CHINA

个人存款证明 PERSONAL CERTIFICATE OF DEPOSIT

号 码 No.: 13246983

开立日期 Date: 2024/02/15

兹证明 杜玉琴 先生 / 女士

(有效身份证件名称: 居民身份证 证件号码: 120109197308201047)

自 2024 年 02 月 15 日到 2024 年 06 月 15 日 在我行存款如下:

We hereby certify that from 15/02/2024 (DD/MM/YYYY) to 15/06/2024 (DD/MM/YYYY)

Mr/Ms DU YUQIN

(type of valid identification Chinese citizen identification ID No. 120109197308201047)

has deposit accounts with the bank as follows:

存款账号 Deposit Accounts No.	存款种类 Type of Deposit	货币 / 金额 Currency & Amount	存入日 Deposit Date
00000273997321350/00101	定期 Term account	CNY300,000.00	2023/07/18
00000273997321350/00102	定期 Term account	CNY10,000.00	2023/07/19
00000273997321350/00103	定期 Term account	CNY90,000.00	2023/07/19
00000273997321350/00104	定期 Term account	CNY100,000.00	2023/07/23
00000273997321350/00105	定期 Term account	CNY100,000.00	2023/07/25
00000273997321350/00106	定期 Term account	CNY100,000.00	2023/08/21
*****END*****			

备注: 有关本个人存款证明相关说明详见背面条款, 请您仔细阅读。

Remarks: For notes of the Personal Certificate of Deposit, please refer to the terms and conditions on the back. Please read carefully.



中国银行股份有限公司 (167) 行 (盖章)
Bank of China Limited Branch (Seal)



3rd Nov., 2023

To Whom It May Concern,

This is to recommend Mr. Haoran Xu from the programme of Applied Mathematics at the Xi'an Jiaotong Liverpool University (in short XJTLU) for his application to the postgraduate programme at your University in the capacity of Mathematics lecturer at the Xi'an Jiaotong Liverpool University, the partner University of Liverpool in China.

I had taught Haoran the module MTH106 *Introduction to the Methods of Applied Mathematics* in his study at XJTLU. Haoran had participated all the learning and teaching activities and completed all the coursework timely. Haoran had used the online learning platform Webassign in MTH106 to finish all the coursework and performed active learning. His performance in this module was well recognized by the final mark 96 out of 100.

Haoran had improved himself in research activities, internship and voluntary jobs at XJTLU. His excellent communication skills and team work spirit can be seen in these activities. He had excellent academic record. This can be seen from his award from the university: Academic Excellence Award in 2021 and Academic Achievement Award in 2022, which only offered to the top 10% and top 5% students in this programme respectively. I would expect that he should obtain a first-class degree with overall average 80+ after graduation.

All the modules at XJTLU had been delivered and assessed in English. Therefore, he should be able to follow any English learning and research environment.

Please feel free to contact me for further information.

Regards,

Dr. Gang Liu
Senior Associate Professor
Deputy Dean at the School of Mathematics and Physics and Acting Head of Pure Mathematics
Email: Gang.Liu@xjtlu.edu.cn
Tel: 8651288161631



Xi'an Jiaotong-Liverpool University
西交利物浦大学

To whom it may concern,

Dear Sir/Madam,

I am delighted to offer my support for Mr. Haoran Xu's application to your program. Haoran is not only one of my students in the Numerical Analysis course, but also my research assistant in various projects, including the Investigations of High-precision Numerical Methods in Data Approximation, which happens to be one of my summer projects.

Haoran possesses strong logical abilities and is a fast learner. Under my guidance, he attained a high level of proficiency in executing various tasks and acquired the skills to process data according to project requirements. By swiftly understanding project needs and delivering results that exceeded my expectations, he made significant contributions to the "Investigations of High-precision Numerical Methods in Data Approximation."

Haoran demonstrates exceptional resilience under pressure and is fully capable of working independently on projects. He took charge of literature and policy reviews in the "Investigations of High-precision Numerical Methods in Data Approximation" project, actively scouring industry databases and public sources to summarize quantitative indicators utilized in our modeling analyses. Throughout this process, he displayed a remarkable level of efficiency, patience, and responsibility.

During his time studying and working with me, Haoran consistently demonstrated exceptional insights and strong work ethics. With a solid mathematical background, he was able to quickly analyze problems, establish frameworks, and provide valuable input. In problem-solving, he prioritizes gathering and processing information to make rational decisions instead of rushing for quick outcomes. When reporting his progress, he takes ownership and pays meticulous attention to details. Overall, he is one of the best research assistants I have worked with in recent years.

With his impressive academic strengths, exceptional intellectual potential, and outstanding work ethics, I am confident that Mr. Haoran Xu would make a highly deserving candidate for your esteemed institute and master's program. I wholeheartedly recommend him and wish him continued success in all his future studies and career endeavors.

Yours sincerely,

Qiang Niu