

# Yueting Han

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## EDUCATION

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| <b>University of Warwick, UK</b>   | (MSc leading to PhD) Mathematics of Systems | Sep 2021 -          |
| <ul style="list-style-type: none"><li>• Four-year Scholarship covering fees and maintenance stipend funded by EPSRC</li><li>• Research Interests: Data Science</li></ul> |   |                     |
| <b>University of Liverpool, Liverpool, UK</b>  | Bachelor of Science in Mathematics          | Sep 2019 - Jun 2021 |
| <b>Xi'an Jiaotong - Liverpool University, China</b>  | Bachelor of Science in Applied Mathematics  | Sep 2017 - Jun 2021 |
| <ul style="list-style-type: none"><li>• Dual Degree Program</li><li>• First-class Honours</li></ul>  |   |                     |

## RESEARCH EXPERIENCE

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<b>Research Assistant</b>	<i>High-performance Computing Lab of Tsinghua University</i>	Aug 2019 - Sep 2019
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Research on Parallel Implementation of LBM Computing Fluid Dynamics Simulation

- Designed parallel algorithms to optimize the LBM Computing Fluid Dynamics Simulation and improved the performance by 172 times
- Developed separate data modules with C++ to implement parallel optimization schemes
- Developed data interaction module with C++ to process inter-process communications
- Specified and tested the boundary conditions of data modules according to certain algorithms

<b>Research Assistant</b>	<i>High-performance Computing Lab of Tsinghua University</i>	Jan 2019
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Data Processing of LBM Computing Fluid Dynamics Simulation

- Conducted literature research on LBM Computing Fluid Dynamics Simulation and created dataset from various graphs using Plot Digitizer
- Filtered and sorted calculated simulation results with Java Programming and Excel for more comprehensive and accurate data analysis
- Further processed the data with MATLAB by applied Fourier Transform to calculated simulation results
- Performed validation with obtained dataset by constructing graphs with MATLAB

## PROJECTS

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<b>Face Recognition Using Support Vector Machines</b>	May 2021
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- Converted images of two individuals into vectors containing training points and label them with -1 and 1 respectively
- Formulated training points and their labels into the convex quadratic optimization problem
- Obtained the maximum margin separating hyperplane through relevant built-in function in MATLAB Optimization tool
- Classified new images according to the hyperplane

<b>Breaking Permutation Ciphers Using Markov Chain Monte Carlo</b>	Apr 2021
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- Extracted key information of deciphering from Tolstoy's *War and Peace*
- Obtained the most plausible permutation through MATLAB implementation of the Metropolis-Hastings algorithm according to the key information and associated plausibility
- Decrypted and output the ciphertext with the permutation

<b>Quadrature</b>	Apr 2020
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- Derived Newton-Cotes Quadrature that was based on evaluating the integrand at equally spaced nodes, including Trapezium Rule, Simpson's Rule and Five Point Rule
- Formulated the overall leading order absolute error and estimated the impact of adjusting the distance between each pair of

nodes which were at even distance

- Studied Gaussian Quadrature with interpolatory on optimally chosen point sets to further improve the accuracy
- Evaluated the performance of each method and validated the obtained results by programming in Maple with the accuracy of results prioritized

### **Root-finding for Nonlinear Equations**

- Found roots with bisection method, false position method, secant method and Newton-Raphson method Mar. 2020
- Tested and validated the results of each method
- Evaluated the performance of each method from the aspects of applicability, generality and rate of convergence
- Performed validation on the analysis by programming in Maple with the accuracy of result prioritized

### **Transportation Problem**

Oct 2019

- Utilized transportation table to minimize the cost of distributing the commodity from a number of sellers to a number of buyers
- Studied the balanced transportation problem with the transportation table by finding an initial basic feasible solution, and checking for optimality and improvement
- Obtained the method to solve an unbalanced transportation problem by introducing one more seller or buyer, which was based on the approach to solving a balanced problem
- Evaluated and verified the effectiveness of the method which minimizes the cost through introducing theorems about spanning tree

### **Analysis of Predator-Prey Interaction**

Jun 2019

- Made assumptions about the environment and evolution of the predator and prey populations, such as the prey were assumed to have an unlimited food supply
- Built Lotka-Volterra model to predict the size of the predator and prey populations
- Found and classified equilibria using nullcline diagram and obtained the corresponding phase portrait
- Investigated the model by fitting it to the dataset of population figures

### **Garden Game**

Apr 2019

- Developed a game with Java in Netbeans for players to plant flowers in a garden
- Designed a user interface to choose the types of flowers and the planting pattern
- Developed modules to import images of flowers and flowerbeds and to display the growth of flowers

## **SKILLS**

Programming Languages: Java, C++, Python

Tools: MATLAB, Maple, Minitab, SPSS, Plot Digitizer, Microsoft Excel

## **IELTS & GRE SCORES**

IELTS: 7.5 overall in 2019

GRE: Quantitative Reasoning 170 & Verbal Reasoning 152 in 2020

## **VOLUNTEER EXPERIENCE**

- As a volunteer leader for Five Universities League Activity, organized the campus tour and the game session Jun 2019
- Volunteered to provide mentoring and campus tour for Overseas Buddy Activity Sep 2018
- Volunteered to provide mentoring for XJTLU's Independent Recruitment of Students Nov 2017