Yueting Han

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EDUCATION

University of Warwick, UK (MSc leading to PhD) Mathematics of Systems Sep 2021 -

- Four-year Scholarship covering fees and maintenance stipend funded by EPSRC
- Research Interests: Data Science

University of Liverpool, Liverpool, UK Bachelor of Science in Mathematics Sep 2019 - Jun 2021

Xi'an Jiaotong - Liverpool University, China Bachelor of Science in Applied Mathematics Sep 2017 - Jun 2021

- Dual Degree Program
- First-class Honours

RESEARCH EXPERIENCE

Research Assistant *High-performance Computing Lab of Tsinghua University*

Research on Artificial Intelligence Computational Fluid Dynamics Jun 2021 - Sep 2021

- Created data sets of flow around a circular cylinder with OpenFOAM and visualized them using ParaView
- Designed algorithms for sampling point cloud centers with Python as a part of PointNet++ architecture
- Performed validation with Boundary Layer Code for Computational Fluid Dynamics with MATLAB

Research on Parallel Implementation of LBM Computing Fluid Dynamics Simulation Aug 2019 - Sep 2019

- 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

Data Processing of LBM Computing Fluid Dynamics Simulation Jan 2019

- 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

Face Recognition Using Support Vector Machines May 2021

- 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

Breaking Permutation Ciphers Using Markov Chain Monte Carlo Apr 2021

- 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

Quadrature Apr 2020

- 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 bisector 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

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, OpenFOAM, ParaView, Plot Digitizer

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