

YUAN CHEN

PERSONAL DATA

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EDUCATION

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| Expected 2021 | The George Washington University
M.S. in Statistics
GPA: 4.0/4.0
Course Work: Mathematical Statistics I & II, Regression Analysis, Stochastic Process (Ph.D.), Survival Analysis, Probability (Ph.D.), Advanced Statistical Theory (Ph.D.), Multivariate Analysis (Ph.D.) |
| Expected 2021 | The George Washington University
Certificate in Mathematics
GPA: 4.0/4.0
Course Work: Real Analysis, Measure Theory and Integration, Stochastic Calculus*, Functional Analysis*, Numerical Methods for Partial Differential Equations* |
| June 2019 | Hohai University
B.E. Environmental Science
GPA: 90.7/100; Rank: the 1 st place
Course Work: Data and Analysis, Machine Learning, Introduction to Partial Differential Equations, Geographical Information System, Statistics and Life, Bayesian Statistics I & II (certificated online), Practical Time Series Analysis (certificated online) |

RESEARCH INTERESTS

1. Numerical Methods for Partial Differential Eq.s: Finite Element Method
2. Stochastic Methods for Partial Differential Eq.s: Deep Ritz Method, Monte Carlo Method
3. Interface problems: Partial Differential Eq.s with discontinuities coefficients across 'interfaces'
4. Error Analysis of Immersed Finite Element Method (IFEM) for interface problems
5. Applications of statistics and economics on environmental problems

PUBLICATIONS

4. Y. CHEN, X. ZHANG, AND S. HOU. *Error Estimates for a Partially Penalized Immersed Finite Element Method for Elastodynamic Interface Problems*, manuscript.
3. Y. CHEN, H. WANG, H. YAN, D. LIANG, X. HE, AND R. LI. *A Novel View to Understand the Spatiotemporal Variation of Nutrients in Urban River Networks from Energy Scale*, Water, under review.
2. Y. CHEN, S. HOU, AND X. ZHANG. *A Bilinear Partially Penalized Immersed Finite Element Method for Elliptic Interface Problems with Multi-domains and Triple Junction Points*, Results Appl. Math., (2020), in press.
1. Y. CHEN, S. HOU, AND X. ZHANG. *An Immersed Finite Element Method for Elliptic Interface Problems with Multi-domain and Triple Junction Points*, Adv. Appl. Math. Mech., 11(2019), no. 5, 1005-1021.

TALKS AND POSTERS

2. Immersed Finite Element Methods for Interface Problems with Multi-Domains and Triple-Junction Points. **GW Research Day**, The George Washington University, D.C. (April 2020, Online).
1. Immersed Finite Element Methods for Interface Problems with Multi-Domains and Triple-Junction Points. **AMS Southeastern Sectional Meeting**, University of Virginia, VA (March 2020, Cancelled).

RESEARCH EXPERIENCES

Present	Research on Time-dependent Elasticity Interface Problems Co-advised by Prof. Xu Zhang and Prof. Songming Hou <ul style="list-style-type: none"> Designed a fully discrete scheme for time-dependent elasticity interface problems based on Partially Penalized Immersed Finite Element Method (PPIFEM) Implemented multi-processing programs to verify the proposed scheme on numerical examples, showed optimal order convergence in L_2 and semi-H_1 norm using NumPy, SciPy package in Python Proved the unconditional stability for Symmetric case. Completed a-priori error estimation for proposed scheme: proved the optimal convergence of numerical solution in energy norm and L^2 norm under the standard piecewise H^2 regularity assumption of exact solution
Nov. 2019	Improved Research on Multi-domain Elliptic Interface Problems Advised by Prof. Songming Hou <ul style="list-style-type: none"> Established a bilinear approximate scheme and a corresponding weak form with additional penalty on triple elements to solve elliptic interface problems with multi-domains and triple junction points Enriched the local approximating spaces by adding extra jump terms to accommodate non-homogeneous flux jump condition Proved trace inequalities and degeneracy property of local linear system and verified optimal order convergence in L_2, semi-H_1 norm without deterioration of the method numerically
June 2019	Research on River Dynamic Estimate Advised by Prof. Hua Wang <ul style="list-style-type: none"> Established an estimator to measure flowing river energy based on Gauss Quadrature. Combined field hydrology data with simulated data to calculate total energy of Binhu network, China using Python Applied a curve fitting method coupled with least square method to identify negative exponential relationship between river mechanic energy and nutrient concentration Produced an program to cleanse, manipulate and conduct visualization on 5 million rows of spatial hydraulic and water quality data in Python. This program is now supporting colleagues to conduct further analysis
Nov. 2018	Research on Multi-domain Elliptic Interface Problems Advised by Prof. Songming Hou <ul style="list-style-type: none"> Solved continuous elliptic interface problems with multi-domains and triple junction points by establishing a linear interpolation scheme based on Classical Immersed Finite Element Method (IFEM) Implemented proposed method on three numerical examples using NumPy package in Python to show the optimal order convergence of numerical results in L_2 and semi-H_1 norm Solved two-domain elliptic interface problems with discontinuous jump condition by extending Classic IFEM with an extra term and verified the optimal convergence in L_2 and semi-H_1 norm numerically

PROJECTS

Dec. 2019	Project of House Price Prediction in King County, WA Project Leader, Kaggle.com <ul style="list-style-type: none"> Established a linear model to predict house price with 15 variables including house sales and city economic factors. Evaluated and selected potential reduced models using Akaike information criterion (AIC) and Bayesian information criterion (BIC) in R Modified selected models to meet assumptions of linear regression in R: excluded outliers based on Cook's distance and Studentized Residual Rules; removed correlated variables according to Generalized Variance Inflation Factor (GVIF); transformed dependent variable to obtain constant residual variance; employed Durbin-Watson Test to examine autocorrelation of residuals; applied Shapiro-Wilk test to check residual normality
Dec. 2018	Project of Statistical Analysis on Energy Policy Project Assistant, Key Shallow Lake Lab. <ul style="list-style-type: none"> Explored influence of social-economic and environmental factors to carbon emission evolution of Beijing's thermal power plants from 1997 to 2015. Applied a Logarithmic Mean Divisia Index (LMDI) model to decomposed CO_2 emission into five factors in Python, including economic growth, population growth, energy intensity, energy structure and emission coefficient factor Collected approx. 14 million rows of agricultural products trade data between 256 countries from 1986 to 2015. Cleansed and manipulated the trade dataset to quantify nitrogen pollution embodied in global trade using Python. Analyzed temporal variation of nitrogen pollution from different trade links and provide suggestions on future national nitrogen management.

PROFESSIONAL EXPERIENCES

Sep. 2018	Mobike Technology Co., Ltd. (Meituan.com) Product Manager Internship in Department of Data Analysis <ul style="list-style-type: none">Retrieved and aggregated 1 million rows of raw data from mobile app to analyze different user behaviors for optimizing function designProduced a user classification function on company's internal platform which supports other colleagues filtrating user data subject to constraints including users' personal backgrounds, physical & value characteristics and past orders, and also optimizing effects of targeted campaignsAnalyzed and visualized label data on malfunction of different bike types through Circos and Sankey diagrams produced in Echarts & D₃ to detect the association between specific bike types and causes of issuesIsolated the testing and formal data production environment to reduce risks from data production failure
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SCHOLARSHIPS & CERTIFICATES

• HOHAI UNIVERSITY Honored Student Scholarship	2016, 2018, 2019
• HOHAI UNIVERSITY Science & Technology Innovation Scholarship	2019
• Certificate of Honored Achievement in Bayesian Statistics I & II, Coursera online course by UCSC	2018
• Certificate of Achievement in Practical Time Series Analysis, Coursera online course by SUNY	2018
• 3 rd Prize of China Undergraduate Mathematical Contest in Modeling	2017

SKILLS

Programming	C/C++, Python, R, MySQL, TeX , VB, MATLAB
Data Analysis	Python (pandas, matplotlib, geopy), R (ggplot, dplyr, tidyr), QGIS, ECHARTS, D ₃ , sas
Sci. Computing	Python (NumPy, SciPy, SymPy, multiprocessing), MATLAB
Deep Learning	Python (Numpy, PyTorch, TensorFlow)
Misc.	Academic Research, MS Office & VBA, Axure RP, Markdown
Language	Mandarin Chinese, English