Zimo Wang

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Education

- **Zhejiang University** — Hangzhou, China
  Bachelor of Science, Geographical Information Science ***(Rank 1st)****;* — *Sep 2019 - Present*
  Major GPA: 4.00/4.00, 93.83/100 GPA: 3.97/4.00, 90.81/100;
  Courses: C Programming, Data Structures, Databases, Spatial Data Analysis, Computer Graphics, Lectures on Programming, RS Digital Image Processing, GIS Application, Scientific Computing, Geographic Information System, GIS Programming, JAVA Programming, Data Mining.

- **Zhejiang University** — Hangzhou, China
  Double Major, Statistics ***(Rank 1st)****; Minor, Computer Science and Technology* — *Sep 2019 - Present*
  Statistics Courses: Mathematical Analysis (I, II, and III), Advanced Algebra, Mathematical Statistics, Probability Theory, Stochastic Processes, Regression Analysis, Ordinary Differential Equations, Computer Simulation, Complex Variable Functions, Time Series Analysis, Real Variable Analysis, Multi-Variate Statistical Analysis.
  Computer Science and Technology Courses: Advanced Data Structure & Algorithm Analysis, Object-Oriented Programming, Advances in Computer Graphics, Artificial Intelligence, Operating System, Theory of Computation.

Honors and Awards

- National Scholarship, Ministry of Education of P.R. China — 2020
- Zhejiang University Scholarship - First Prize, Third Prize, and Second Prize — 2020-2022
- Scholarship for Excellence in Special Major, Zhejiang University — 2020-2022
- Outstanding Student, Zhejiang University — 2020
- National GIS Application Competition, The Geographical Society of China - Outstanding Winner — 2021

Publications

- **Zimo Wang**, Yicheng Wang, Sensen Wu, and Zhenhong Du. **"House Price Valuation Model Based on Geographically Neural Network Weighted Regression: The Case Study of Shenzhen, China"** *ISPRS International Journal of Geo-Information* 11, no. 8: 450. Published. 2022.
- Chaoran Tian, Weihong Pan, **Zimo Wang**, Mao Mao, Guofeng Zhang, Hujun Bao, Ping Tan, Zhaopeng Cui. **"DPS-Net: Deep Polarimetric Stereo Depth Estimation"** *IEEE Conference on Computer Vision and Pattern Recognition* Under Review. 2022.

Research Experiences

- **IDEA Lab of University of Illinois at Urbana-Champaign** — Remote
  Student Summer Research — Advisor: Hanghang Tong — *June 2022 - Oct 2022*
  - **Spatial-Temporal Data Mining**: Predicted the traffic flow pattern based on DCRNN, STAWnet, and Autoformer models.
  - **Transformer Modeling in PyTorch**: Integrated cutting-edge models including Informer as well as Autoformer, and discovered graph information implicitly and dynamically without prior knowledge.
  - **Long-term Prediction with Fourier Analysis**: Provided an innovative cross-correlation mechanism with the help of Fourier decomposition. The correlation coefficients to several specific time lags can be rapidly solved with a complexity $NlogN$.
  - **Dynamic Time Lags with Time Stamps**: Learned the time lag relationships from time stamps, so that the geographical upstream and downstream relationships could be determined dynamically, and even some distant correlations could be examined.

- **State Key Laboratory of CAD & CG of Zhejiang University** — On-Site
  Student Research Assistant (Part-Time) — Advisor: Zhaopeng Cui — *Aug 2021 - Aug 2022*
  - **SOTA Depth Estimation with Polarization Information**: Reconstructed depth with RGB and polarization stereo with a novel look-and-move mechanism. The application of polarization images open up a new task and enabled our model to outperform all the other depth estimation models.
  - **Dataset Processing**: Participated in the image collection, image synthesis, and dataset retrieval; Explored the UE4 engine to render synthetic data and took real images for our research.

- **Extension of Experiments**: Applied models on several datasets, ran baselines on the remote server, and drew illustrations in our paper.
- **Deep Involvement of Computer Vision Research**: Made presentations in the group meeting, grasped the whole process of computer vision research, independently authored the section of related works and modified the paper.

- **Zhejiang Provincial Laboratory of GIS** On-site
  Student Research Assistant (Part-Time) — Advisors: Sensen Wu, Zhenhong Du *Mar 2021 - Apr 2022*
  - **House Price Valuation Model Based on Geographic Neural Network Weighted Regression**: Implemented a case study in Shenzhen and achieved state-of-the-art valuation model through neural networks.
  - **Innovative Combination Between Traditional Statistical Model and Neural Networks**: Assessed a more accurate kernel function from geographical weighted regression with the help of neural networks.
  - **Estimation of Spatial Heterogeneity**: With thorough visualized analysis and two kinds of hypothesis testing, I was able to theoretically prove that the coefficients of each variable in our regression model are necessary to vary spatially.
  - **Data Crawling and Analysis**: Collected and cleaned the house price data in Shenzhen, revealed some patterns of the spatial heterogeneity according to the outcome of our model, which perfectly matches with the actual market.
  - **Model Establishment in TensorFlow**: Constructed the whole neural networks in TensorFlow independently. To make comparisons, I also finished a script for geographical weighted regression in ArcGIS and a script for linear regression in R.

Projects

- **NYC Spatial Partitioning Index Visualization and Parallel Acceleration** C/C++
  Course: Advances in Computer Graphics — Professors: Kun Zhou, Zhong Ren *2022*
  - Utilized concepts from the paper *Real-Time KD-Tree Construction on Graphics Hardware* on *SIGGRAPH Asia* 2008 in order to implement a combination of KD-Tree data structure, parallel algorithms, CG and GIS applications.
  - Independently built 3,000 lines of code to complete this project and scored completely full marks for this course by the top-level professors in the computer graphics realm.
- **Mini Shakespeare Search Engine** C/C++
  Course: Advanced Data Structure & Algorithm Analysis — Professor: Yue Chen *2022*
  - As the leader, I instructed the other group members to implement stop filter, sentence query threshold, and an inverted file index with B+ tree structures. As For large datasets, our B+ tree index has also been extended to the term partitioned one.
- **3D Maze Game** C/C++
  Course: Computer Graphics — Professor: Ruofeng Tong *2021*
  - Built a maze Game using the OpenGL framework with GLAD library, and learned how to render static and dynamic 3D objects with different kinds of shaders and flexible illumination models.
- **Nonlinear Equations Solver for Camera Calibration** C
  Course: Contemporary Surveying — Professor: Dengfeng Chai *2021*
  - Developed 700 lines of code which apply the numerical differentiation method and Newton method to solve the simultaneous non-linear equations.
  - Accomplished all basic matrix operators singly, including the inverse, multiplication and non-linear equation solver.
  - As part of this project I also used my library for the following additional tasks: space resection, camera relative orientation, and absolute orientation.

Leadership and Activities

- **Volunteering**: Student Volunteer Award 2020, Five Star Volunteer Award 2021, with 300+ volunteer hours.
- **Debating**: Captain of high school debate team, Captain of college debate team, awarded the second place prize for Zhejiang University Freshman Debate Competition.
- **Stargazing**: The First Prize of Zhejiang Provincial Astronomy Olympiad 2017, Silver Award of Chinese National Astronomy Olympiad 2018, the Astronomy Club founder and president in high school.

Skills

- **Programming Languages**: C/C++, JAVA, Python (numpy, pandas, scikit-learn, TensorFlow, PyTorch), SQL, LaTex, Risc-V Assembly, R
- **Technical**: Matlab, ArcGIS, Git, Linux, PostgreSQL, GNU
- **Standardized Tests**: TOEFL MyBest: 104 (Reading 29, Listening 26, Speaking 22, Writing 27);
  GRE: Verbal 158, Quantitative 170, Analytical Writing 3.5