# Di Weng

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**EDUCATION**

**Zhejiang University**, Hangzhou, China

- Ph.D. in Computer Science        Sep 2016 – Dec 2021
  - Advised by Prof. Yingcai Wu at State Key Lab of CAD&CG
  - Research Interest: *Spatio-temporal Data Analysis and Pattern Mining*
  - Research Interest: *Visualization and Visual Analytics of Massive Urban Data*

**Shandong University**, Shandong China

- B.Eng. in Computer Science, Taishan Honored College        Sep 2012 – Jun 2016

**INTERNSHIPS**

**Zhejiang Lab**, Hangzhou, China

- Research Intern, Research Center for Integrated Intelligence        May 2020 – Current
  - Supervisors: Prof. Yingcai Wu and Prof. Wei Chen
  - Contributed to the key idea and development of a big data visual analytics platform (*currently a work in progress*)
  - Built and maintained a distributed cluster for general services

**Monash University**, Melbourne, Australia

- Visiting Research Student, Immersive Analytics Lab        Jul 2019 – Jan 2020
  - Supervisors: Prof. Tim Dwyer and Prof. Kim Marriott (supported by China Scholarship Council)
  - Studied the interactions between users and 2D data visualizations in the VR environment

**JD Finance**, Beijing, China

- Research Intern, Urban Computing Business Unit        Apr 2018 – Sep 2018
  - Supervisors: Dr. Yu Zheng and Dr. Jie Bao
  - Designed and implemented Business Credit Map, a visualization product for authorities to analyze local businesses based on their credit information (Chinese product page: dwz.cn/qheF9ZNm)

**RESEARCH**

**Interactive Location Selection**

- Proposed a visual analytics system for **selecting optimal billboard locations based on massive taxi trajectories**. The system adopts an iterative approach that combines a heuristic mining model and multi-criteria visualizations to facilitate effective decision-making. (*Published in IEEE TVCG*[7], *a top-tier visualization journal*)
- Proposed a visual analytics system for **finding ideal homes based on daily routines**. Based on the concept of reachability, the system extracts the home locations that satisfy the given routines and visualizes them for users to conduct comprehensive evaluation. (*Published in ACM CHI*[6], *a top-tier human-computer interaction conference*)
- Proposed a general visualization technique for **depicting the rankings of massive locations within the spatial context**. This technique allows users to flexibly filter, evaluate, and compare a large number of locations based on their rankings and spatial contexts directly on the map. (*Published in IEEE TVCG*[5])

**Interactive Bus Route Planning**

- Proposed **a new route generation method** that extracts feasible bus routes from origin-destination data based on the Monte-Carlo search tree approach. Our method outperforms the state-of-the-art ones in terms of efficiency, performance, and flexibility. (*Published in IEEE ITS*[3], *a top-tier intelligent transportation journal*)
- Proposed a novel visual analytics system for urban planners to **interactively identify problematic routes** based on massive bus trip data and to **iteratively determine best replacement routes** with the aforementioned method and a new progressive spatial decision-making approach. (*To appear in IEEE TVCG*[1])

**Spatiotemporal Pattern Mining and Visual Analytics**

- Proposed a visual analytics system for **extracting and analyzing the propagation patterns of air pollution**. A sophisticated model was developed to capture the frequent occurrences of propagation topologies, which were subsequently visualized with hierarchically-organized views. (*Published in IEEE TVCG*[4])
- Proposed a visual analytics system for **capturing and analyzing the co-occurrences patterns across urban datasets**. The frequently-occurring value range combinations across different datasets were extracted and visualized to help experts understand the causes of various urban events. (*Published in IEEE ITS*[2])

**Interactions with 2D Visualization in VR Environment**

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- Studied the interactions with remote 2D visualizations based on the concept of world in miniature, where each visualization can be operated via a proxy within the controllers' reach. (*work in progress*)

**Big Data Visual Analytics Platform**

- Developed a unified visual analytics platform for processing, visualizing, and presenting massive data based on computational graphs, reusable visualization components, and abstract rendering layers. (*work in progress*)

**Business Credit Map**

- Designed and implemented Business Credit Map, a visualization product that allows authorities to gain insights into the reliability of local businesses. This product was demonstrated at 2018 Forum for Credit System Construction of Chinese Cities. (Detailed Chinese descriptions and the demonstration video: dwz.cn/qheF9ZNm)

**PUBLICATIONS**

[1] **D. Weng**, C. Zheng, Z. Deng, M. Ma, J. Bao, Y. Zheng, M. Xu, and Y. Wu. *"Towards Better Bus Networks: A Visual Analytics Approach."* To appear in IEEE Transactions on Visualization and Computer Graphics (Also appears in IEEE VAST 2020, **CCF-A**), 2021.

[2] Y. Wu, **D. Weng**, Z. Deng, J. Bao, M. Xu, Z. Wang, Y. Zheng, Z. Ding, and W. Chen. *"Towards Better Detection and Analysis of Massive Spatio-Temporal Co-Occurrence Patterns."* To appear in IEEE Transactions on Intelligent Transportation Systems (**CCF-B, IF=6.319**), 2020.

[3] **D. Weng**, R. Chen, J. Zhang, J. Bao, Y. Zheng, and Y. Wu. *"Pareto-Optimal Transit Route Planning with Multi-Objective Monte-Carlo Tree Search."* To appear in IEEE Transactions on Intelligent Transportation Systems (**CCF-B, IF=6.319**), 2020.

[4] Z. Deng, **D. Weng**, J. Chen, R. Liu, Z. Wang, J. Bao, Y. Zheng, and Y. Wu. *"AirVis: Visual Analytics of Air Pollution Propagation."* IEEE Transactions on Visualization and Computer Graphics (Also appears in IEEE VAST 2019, **CCF-A**), 2020.

[5] **D. Weng**, R. Chen, Z. Deng, F. Wu, J. Chen, and Y. Wu. *"SRVis: Towards Better Spatial Integration in Ranking Visualization."* IEEE Transactions on Visualization and Computer Graphics (Also appears in IEEE InfoVis 2018, **CCF-A**), 2019.

[6] **D. Weng**, H. Zhu, J. Bao, Y. Zheng, and Y. Wu. *"HomeFinder Revisited: Finding Ideal Homes with Reachability-Centric Multi-Criteria Decision Making."* Proc. of ACM Conference on Human Factors in Computing Systems (**CCF-A**), 2018.

[7] D. Liu, **D. Weng**, Y. Li, J. Bao, Y. Zheng, H. Qu, and Y. Wu. *"SmartAdP: Visual Analytics of Large-scale Taxi Trajectories for Selecting Billboard Locations."* IEEE Transactions on Visualization and Computer Graphics (Also appears in IEEE VAST 2016, **CCF-A**), 2017.

**AWARDS & SCHOLARSHIPS**

| | |
|---|---|
| - National Scholarship | 2019 |
| - China Scholarship Council Ph.D. Scholarship | 2019 |
| - Luzengyong CAD&CG High Technology Award, Third Prize | 2019 |
| - Wenchixiang Ph.D. Scholarship | 2018 |
| - MSRA Fellowship Nomination Award | 2018 |
| - ACM–ICPC Beijing Invitational Contest, Bronze | 2014 |
| - ACM–ICPC Shandong Provincial Contest, Silver | 2014 |

**PRESENTATIONS**

**SRVis: Towards Better Ranking Integration in Ranking Visualization** 2018
TVCG Session on Data Visualization, SIGGRAPH Asia 2018, Tokyo, Japan

**SRVis: Towards Better Ranking Integration in Ranking Visualization** 2018
IEEE VIS 2018, Phoneix, U.S.

**HomeFinder Revisited Finding Ideal Homes with Reachability-Centric Multi-Criteria Decision Making** 2018
ACM CHI 2018, Montreal, Canada

**Best Practices and Case Studies on Full-Stack VA System Development** 2017
Zhejiang University International Summer School on Visual Analytics, Hangzhou, China

**Location Selection of Billboards Based on Large-Scale Taxi Trajectories** 2016
ChinaVis 2016, Changsha, China

|  | **Visual Analytics of Large-Scale Urban Data** | 2016 |
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|  | China R Conference and Southern China Data Science Conference, Guangzhou, China |  |
|  | **Developing Visual Analytics Systems with MEAN.js Framework** | 2016 |
|  | Zhejiang University International Summer School on Visual Analytics, Hangzhou, China |  |

| SKILLS | **Web Development** | 5 / 5 |
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|  | HTML, CSS, JavaScript, TypeScript, Vue.js |  |
|  | **Native Development** | 5 / 5 |
|  | C, C++, Python, Golang, Node.js |  |
|  | **Infrastructures** | 4 / 5 |
|  | Linux, SQL, Docker, Kubernetes, Network Security |  |
|  | **VR & Graphics Development** | 4 / 5 |
|  | C#, Unity, Shaders, MRTK, VRTK |  |

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