Di Zhu

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EDUCATION

2014 – Now **Ph.D. Candidate** Cartography and Geographic Information Science.
Institute of Remote Sensing and Geographical Information Systems, Peking University.

2017 – Now **Research Assistant**
School of Earth and Space Sciences, Peking University.

2018 – Now **Visiting Researcher**
Department of Civil, Environmental & Geomatic Engineering, University College London.

2010 – 2014 **B.S.** Geographic Information Systems.
School of Earth and Space Sciences, Peking University.

2011 – 2014 **B.S.** Economics.
National School of Development, Peking University.

ACADEMIC EXPERIENCES

Peer-reviewed Journal Papers

1 Zhu, D., Cheng, X., Zhang, F., Yao, X., Gao, Y., & Liu, Y. (2019). Spatial interpolation using conditional generative adversarial neural networks. ***International Journal of Geographical Information Science***, 1–24. https://doi.org/10.1080/13658816.2019.1599122

2 Zhang, F., Wu, L., Zhu, D., & Liu, Y. (2019). Social sensing from street-level imagery: a case study in learning urban mobility patterns. ***ISPRS Journal of Photogrammetry and Remote Sensing***, *153*, 48–58. https://doi.org/10.1016/j.isprsjprs.2019.04.017

3 Zhu, D., Huang, Z., Shi, L., Wu, L., & Liu, Y. (2018). Inferring spatial interaction patterns from sequential snapshots of spatial distributions. ***International Journal of Geographical Information Science***, *4*(32), 783–805. https://doi.org/10.1080/13658816.2017.1413192

4 Zhu, D., Wang, N., Wu, L., & Liu, Y. (2017). Street as a big geo-data assembly and analysis unit in urban studies: a case study using beijing taxi data. ***Applied Geography***, *86*, 152–164. https://doi.org/10.1016/j.apgeog.2017.07.001

5 Zhang, S., Zhu, D., Yao, X., Cheng, X., He, H., & Liu, Y. (2018). The scale effect on spatial interaction patterns: an empirical study using taxi od data of beijing and shanghai. ***IEEE Access***, *6*, 51994–52003. (**Co-first author & corresponding author**). https://doi.org/10.1109/ACCESS.2018.2869378

6 Zhu, D. & Liu, Y. (2018a). Modelling irregular spatial patterns using graph convolutional neural networks. ***arXiv preprint***, arXiv:1808.09802. https://arxiv.org/abs/1808.09802

7 Yao, X., Zhu, D., Gao, Y., Wu, L., Zhang, P., & Liu, Y. (2018). A stepwise spatio-temporal flow clustering method for discovering mobility trends. ***IEEE Access***, *6*, 44666–44675. https://doi.org/10.1109/ACCESS.2018.2864662

8 Yao, X., Wu, L., Zhu, D., Gao, Y., & Liu, Y. (2018). Visualizing spatial interaction characteristics with direction-based pattern maps. ***Journal of Visualization***, 1–15. https://doi.org/10.1007/s12650-018-00543-4

9 Wu, L., Cheng, X., Kang, C., Zhu, D., Huang, Z., & Liu, Y. (2018). A framework for mixed use decomposition based on temporal activity signatures extracted from big geo-data. ***International Journal of Digital Earth***. https://doi.org/10.1080/17538947.2018.1556353

10 Zhu, D. & Liu, Y. (2017). An incremental map-matching method based on road network topology. ***GEOMATICS AND INFORMATION SCIENCE OF WUHAN UNIVERS***, *42*(1), 77–83. http://ch.whu.edu.cn/CN/10.13203/j.whugis20150016

11 Liu, Y., Zhan, Z., Zhu, D., Chai, Y., Ma, X., & Wu, L. (2018). Incorporating multi-source big geo-data to sense spatial heterogeneity patterns in urban space. ***GEOMATICS AND INFORMATION SCIENCE OF WUHAN UNIVERS***, *43*(3), 327–335. https://doi.org/10.13203/j.whugis20170383

12 Zhu, D., Zhang, F., Wang, S., Cheng, X., Wang, Y., Huang, Z., & Liu, Y. (2019). Understanding place characteristics in geographic contexts through graph convolutional neural networks. ***Annals of American Association of Geographers***. (under review).

13 Zhu, D., Yao, X., Cheng, X., Zhang, F., Zhang, Y., Huang, Z., & Liu, Y. (2019). Estimating spatial configuration of intra-urban human activities using graph convolutional neural networks. ***EPJ Data Science***. (under review).

Conferences and Invited Talks

1 Zhu, D., Cheng, T., & Liu, Y. (2019). Geo-propagation from incomplete spatial distribution data: a case study of house price estimation. In *Proceedings of the 27th conference on gis research uk (oral presentation)* (Vol. 41). Newcastle upon Tyne, United Kingdom. http://www.newcastle.gisruk.org/proceedings/

2 Zhu, D. (2019, February). Inferring flow patterns from sequential snapshots of spatial distributions. Invited talk at *Geospatial Seminar, University College London*. London, United Kingdom.

3 Wang, Y., Zhu, D., Yin, G., Huang, Z., & Liu, Y. (2019). Investigating local travel speed with spatial network structures and properties. In *Proceedings of the 2nd international conference on urban informatics (oral presentation)*. Hong Kong, China.

4 Zhu, D. & Liu, Y. (2018b). Modelling spatial patterns using graph convolutional networks (Short Paper). In *10th international conference on geographic information science (oral presentation)*. Melbourne, Australia. doi:10.4230/LIPIcs.GISCIENCE.2018.73

5 Zhu, D., Shi, L., Wang, Y., Cheng, X., & Liu, Y. (2017). Infer spatial interaction patterns from spatial distributions. In *The 25th international conference on geoinformatics (oral presentation)*. Buffalo, USA.

6 Zhu, D., Wang, N., & Liu, Y. (2016). Street perspective: a novel spatial unit in urban social sensing. In *17th international symposium on spatial data handling (oral presentation)*. Beijing, China.

7 Zhu, D. & Liu, Y. (2016). The distance effect in spatial interaction and spatial similarity: a big data view of tobler's first law. In *The 33rd international geographical congress (oral presentation)*. Beijing, China.

PROJECTS

2019.01-2023.12 **The Major Program of the National Natural Science Foundation of China (no. 41830645)**
Theoretical and analytical methods of spatial interaction networks in geo-spatial big data (CI).

2017.01-2021.12 **National Science Fund for Distinguished Young Scholars (no. 41625003)**
Geo-spatial models and analytical methods (SI).

2017.07-2021.07 **The National Key Research and Development Program of China (no. 2017YFB0503600)**
Big geo-data mining and spatio-temporal pattern discovery (SI).

2018.10-2019.10 **The China Scholarship Council funding (no. 201806010077)**
Modelling spatial heterogeneity and spatial interactions from the big geo-data perspective (PI).

2015.01-2016.12 **National Natural Science Foundation of China (no. 41428102)**
Spatial optimizing of urban facilities to mitigate traffic congestion: a case study of Beijing (SI).

2013.01-2016.12 **National Natural Science Foundation of China (no. 41271386)**
Investigating human mobility pattern based on massive spatio-temporal data (SI).

SELECTED AWARDS

2019 **Travel Award**, Applied Geography Speciality Group, Annual Meeting of American Association of Geography
Early Career Scholarship, GIS Research UK

2018 **Presidential Scholarship**, Peking University
Rising Star Award, College GIS Forum, China
Outstanding Student Award, Peking University
State Scholarship Fund of China, China Scholarship Council

2017 **Tang Lixin Scholarship**, Peking University
Research Assistant Scholarship, Peking University

2016 **Excellent in Academics Award**, Peking University

2015 **Individual Scholarship for Outstanding Scientific Research**, Peking University

2014 **Longruan Tech Scholarship**, Beijing LongRuan Technologies Inc.

2012 **Founder Scholarship**, Peking University

2011 **54 Scholarship**, Peking University

RESEARCH INTERESTS

Geospatial modelling; Social sensing; Spatiotemporal data mining; Applied artificial intelligence

SKILLS

Languages — Mandarin Chinese; English.

Programming — Python, SQL, LaTeX, Pytorch, C#,ASP.NET, Java, C/C++, HTML, CSS, JavaScript, ArcGIS, QGIS.

SKILLS (continued)

Misc. Graphic design, Photography, Violin, Guitar, Modern drama creation.

REFERENCES

Yu Liu
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Peking University
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Lun Wu
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Tao Cheng
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