

# Yu Wang

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## About Me

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I am a Ph.D. student at the Visualization and Graphics Group, Utrecht University, with research interests in high-dimensional data visualization, adversarial training (GAN), and machine learning classifier visualization. Proficient in managing high-dimensional data, I apply machine learning techniques to extract insights, reduce dimensionality, and address complex challenges. Additionally, I am also passionate about Generative AI in art, and hold a gemology diploma from Gem-A, with proficiency in gem identification.

## Education

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I am pursuing two Ph.D. degrees in Visual Data Analytics and Geology, respectively.

**Department of Information and Computing Sciences, Faculty of Science, Utrecht University**    *Mar. 2023 – Summer 2025*

- *Ph.D. Candidate in Visual Data Analytics*
- Supervisor: Prof. Alexandru C. Telea; Dr. Michael Behrisch
- Defense date: July 2025 (planned)

**School of Earth Sciences and Resources, China University of Geosciences, Beijing**    *Sep. 2019 – Jun. 2025*

- *Ph.D. Candidate in Geology*
- Supervisor: Prof. Kunfeng Qiu; Prof. Richard Goldfarb
- Defense date: May 2025 (planned)

**School of Gemmology, China University of Geosciences, Beijing**    *Sep. 2015 – Jun. 2019*

- *B.A. in Product Design*
- GPA: 3.55/4.0

## Research Experience

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**Ph.D. Researcher**    *Mar. 2023 – Present*

*Department of Information and Computing Sciences, Utrecht University*

- Working on Decision Maps for machine learning classifiers, a method for interpretable machine learning.
- Currently focusing on using adversarial training to achieve better inverse projections.

**Ph.D. Researcher**    *Mar. 2019 – Present*

*School of Earth Sciences and Resources, China University of Geosciences, Beijing*

- Machine learning for mineral genetic type classification.
- Built decision boundary maps for mineral genetic types.

## Work Experience

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**AI Engineer Intern**    *Feb. 2022 – Sep. 2022*

*Schlumberger Technologies (Beijing) Ltd.*

- Contributed to the project: *Digital Geo-mechanics Algorithms and Implications for Real-time Drilling*.  
The project integrates various formats of legacy data and focuses on innovating AI learning algorithms and workflows to train a digital geostructure model. This model is designed to label formation rocks, describe geostructures in well-drilling engineering, and self-improve based on real-time drilling data. The prototype has demonstrated significant potential in driving the digital transformation of the oil and gas industry.
  - Worked with a team of ~10 members.
  - Developed a GAN-based solution for lithology reconstruction.
  - Implemented a 3D formation labeling algorithm, reducing complexity from  $O(n^3)$  to  $O(n^2)$ , and cutting runtime from hours to minutes.
  - Created 3D interactive visualizations to showcase the above algorithms.

- Achieved 2nd place in the PUTC Data Science Hackathon 2022 (out of ~100 participants).

## Technical Skills

Generative Adversarial Networks (GANs), Convolutional Neural Networks (CNNs), Decision Maps for Classifier Engineering, Visual Analytics for High-Dimensional Data, Analysis of Multivariate Data, Hyperparameter Optimization, User Interface Design.

Skill Category	Technologies	Years	Proficiency	Usage
<b>Programming Languages</b>	Python	6+ years	Advanced	60k+ lines of code
	JavaScript	1+ years	Intermediate	5k+ lines of code
<b>Data Science &amp; Machine Learning</b>	pandas, NumPy, scikit-learn	5+ years	Advanced	20+ projects
	PyTorch, TensorFlow	4+ years	Intermediate	~10 projects
<b>Web Development</b>	Flask	3+ years	Intermediate	2 projects
	HTML, CSS	2+ years	Intermediate	5+ project
	TensorFlow.js	1+ years	Introductory	1 project
<b>Visualization</b>	Matplotlib, seaborn	5+ years	Advanced	20+ projects
	vispy, pyqtgraph	3+ years	Intermediate	2 projects
	D3.js	1+ years	Intermediate	2 projects
<b>GUI Development</b>	PySide, PyQt	3+ years	Intermediate	2 projects
<b>Version Control</b>	Git, GitHub	5+ years	Advanced	~50 repositories

## Awards

<b>Best Student Paper Award</b>	2024
15th International Conference on Information Visualization Theory and Applications (IVAPP/VISIGRAPP) (out of 431 submissions)	
<b>First-class Doctoral Student Scholarship</b>	2020, 2021
China University of Geosciences, Beijing (CUGB) (top 20% of 150+ students)	
<b>3rd Prize</b>	2018
‘Tianmu Cup’ National Jewelry Identification Professional Skills Competition (out of 1000+ participants)	
<b>2nd Prize</b>	2017
‘Tianmu Cup’ National Jewelry Identification Professional Skills Competition (out of 1000+ participants)	
<b>Professional Scholarship (4 times)</b>	2015–2019
China University of Geosciences, Beijing (top 20% of ~100 students)	

## Selected Publications

- Grosu, C., Wang, Y., Telea, A. An acceleration Technique for Computing Maps with Continues Values. In submission to *Computers & Graphics*.
- Blumberg, D., Wang, Y., Telea, A., Keim, D., Dennig, F. Robust Inversion of Multidimensional Scaling Projections: Improved Reference Selection Strategies. In submission to *Computers & Graphics*.
- Wang, Y., Dennig, F., Telea, A. How to make dogs smile: Controlling inverse projections by maneuvering the lost information. *In submission to IEEE TVCG*. (1<sup>st</sup> **journal worldwide in VA/Visualization**)
- Wang, Y., Telea, A. Investigating Desirable Properties of Inverse Projections and Decision Maps. *Communications in Computer and Information Science*. (to appear).
- Grosu, C., Wang, Y., Telea, A. (2024). Computing fast and accurate decision boundary maps. In *Proc. EuroVA*. (1<sup>st</sup> **venue in Europe on visual analytics**)
- Blumberg, D., Wang, Y., Telea, A., Keim, D., Dennig, F. (2024). Inverting Multidimensional Scaling Projec-

tions Using Data Point Multilateration. In *Proc. EuroVA*. (1<sup>st</sup> venue in Europe on visual analytics)

7. Wang, Y., Qiu, K., Telea, A., Hou Z., Zhou T., Cai Y., Ding Z., Yu H., Deng J. (2024). Interpreting mineral deposit genesis classification with decision maps: A case study using pyrite trace elements. *American Mineralogist*.
8. Telea, A., Machado, A., Wang, Y. (2024). Seeing is Learning in High Dimensions: The Synergy Between Dimensionality Reduction and Machine Learning. *SN Computer Science*, 5(3), 279.
9. Wang, Y., Telea, A. (2024). Fundamental Limitations of Inverse Projections and Decision Maps. In *Proc. IVAPP*, 1, 571–582.
10. Wang Y., Machado, A., Telea, A. (2023). Quantitative and Qualitative Comparison of Decision-Map Techniques for Explaining Classification Models. *Algorithms*, 16(9), 438.
11. Zhu, Z., Zhou, F., Wang, Y., Zhou, T., Hou, Z., Qiu, K. (2022). Machine learning-based approach for zircon classification and genesis determination. *Earth Science Frontiers*, 29(5), 464.
12. Sun, Y., Qiu, K., An, M., Li, S., Shang, Z., Wang, Y. (2022). Geochronological and Geochemical Constraints on the Petrogenesis of Lamprophyre from the Giant Weishan REE Deposit in China. *Minerals*, 12(6), 706.
13. Wang Y., Qiu K. Hou Z., and Yu H. (2022). Quartz Ti/Ge-P discrimination diagram: A machine learning based approach for deposit classification. *Acta Petrologica Sinica*, 38(1): 281-290.
14. Zhou T., Qiu K., Wang Y., Yu H. and Hou Z. (2022). Apatite Eu/Y-Ce discrimination diagram: A big data based approach for provenance classification. *Acta Petrologica Sinica*, 38(1): 291-299.
15. Wang Y., Qiu K., Müller A., Hou Z., Zhu Z., Yu H. (2021). Machine Learning Prediction of Quartz Forming-Environments. *Journal of Geophysical Research: Solid Earth*. 126(8): e2021JB021925. (**Nature Index Journal**)
16. Qiu, K., Deng, J., Yu, H., Wu, M., Wang, Y., Zhang, L., Goldfarb, R. (2021). Identifying hydrothermal quartz vein generations in the Taiyangshan porphyry Cu-Mo deposit (West Qinling, China) using cathodoluminescence, trace element geochemistry, and fluid inclusions. *Ore Geology Reviews*, 128, 103882.

## Conference Presentations

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| - The 15th International EuroVis Workshop on Visual Analytics (EuroVA)<br><i>Odense, Denmark</i> (Non-Speaker)                             | <i>May. 2024</i> |
| - The 15th International Conference on Information Visualization Theory and Applications (IVAPP/VISIGRAPP)<br><i>Rome, Italy</i> (Speaker) | <i>Feb. 2024</i> |
| - EGU General Assembly<br><i>Vienna, Austria</i> (Speaker)   | <i>Apr. 2023</i> |
| - The 15th National Conference on Mineral Deposits<br><i>Hangzhou, China</i> (Speaker)   | <i>Nov. 2020</i> |

## Languages

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**Mandarin** (native); **English** (working proficiency); **Dutch** (A1 level)

## Certificates

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| <b>Deep Learning Non-Credit Specialization</b><br><i>Coursera</i>                                       | <i>2020</i> |
| <b>Gemology with Diploma Distinction (FGA)</b><br><i>Gemological Association of Great Britain</i>       | <i>2017</i> |
| <b>Diploma in Gem Diamond Grading</b><br><i>Gemmological Institute, China University of Geosciences</i> | <i>2017</i> |

## References

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**Prof. dr. Alexandru C. Telea**

*Full professor in Visual Data Analytics, head of Visualization and Graphics research group, Dept. of Information and Computing Sciences, Utrecht University*

[a.c.telea@uu.nl](mailto:a.c.telea@uu.nl)

**Dr. Michael Behrisch**

*Assistant Professor in Visual Analytics at Dept. of Information and Computing Sciences, Utrecht University*

[m.behrisch@uu.nl](mailto:m.behrisch@uu.nl)

## Interest

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Bouldering; Climbing; Powerlifting; Weightlifting; Snowboarding