

# Jinyi Cai

Ph.D. Student

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## RESEARCH INTERESTS

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GIScience, Geovisualization, Social Vulnerability, Environmental Health.

## EDUCATION

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|---|---------------------|
| • <b>Ph.D. in Geographic Information Science and Cartography</b>                                | Sep. 2023 - Present |
| Department of Geographical and Sustainability Sciences, University of Iowa, Iowa City, IA, USA. |                     |
| • <b>M.S. in Geospatial Information Science</b>   | 2020                |
| Department of Geographical Sciences, University of Maryland, College Park, USA.                 |                     |
| • <b>B.S. in Physical Geography, Resource &amp; Environment</b>                                 | 2018                |
| School of Geographical Science, Guangzhou University, Guangzhou, China                          |                     |
| • <b>B.A. in English (dual degree)</b>  | 2018                |
| School of Foreign Studies, Guangzhou University, Guangzhou, China                               |                     |

## EMPLOYMENT

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| <b>Teaching Assistant</b>   | Jan. 2024 – Present   |
| Department of Geographical and Sustainability Sciences, University of Iowa, Iowa City, IA, USA.<br>(GEOG 2050 Foundations of GIS - Spring 2024) |                       |
| <b>Research Assistant</b>   | Aug. 2023 – Dec. 2023 |
| Department of Geographical and Sustainability Sciences, University of Iowa, Iowa City, IA, USA.   |                       |
| <b>Research Assistant</b>   | Apr. 2023 – Aug. 2023 |
| Institute of Space and Earth Information Science, The Chinese University of Hong Kong (CUHK), HK, China.  |                       |
| <b>GIS Developer</b>  | May. 2020 - Apr. 2023 |
| Augur Intelligence Technology LTD, Guangzhou, Guangdong, China  |                       |

## PUBLICATIONS

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### [Manuscripts in Preparation]

**Cai, J.**, Koylu, C., Tate, E., Cwierny, D. (In preparation). Social Vulnerability and Health Impact of Well Nitrate Contamination Exposure in Iowa: An Interpretable Machine Learning Approach. *Regional Environmental Change*.

### [Peer-Reviewed Conference Proceedings]

**Cai, J.**, Kwan, M.-P., Hou, C., Liu, D., & Yam, Y. (2023). Curriculum Design of Artificial Intelligence and Sustainability in Secondary School. *I-GUIDE Forum*. <https://doi.org/10.5703/1288284317666>

## CONFERENCE PRESENTATION

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**Cai, J.**, Koylu, C., Tate, E., Cwierny, D. (June 2024). Social Vulnerability and Health Impact of Well Nitrate Contamination Exposure in Iowa: An Interpretable Machine Learning Approach. CaGIS and UCGIS symposium, 2024, Columbus, OH.

**Cai, J.**, Kwan, M.-P., Hou, C., Liu, D., & Yam, Y. (October 2023). Curriculum Design of Artificial Intelligence and Sustainability in Secondary School. I-GUIDE Forum, 2023, New York, NY.

## HONORS & AWARD

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| Travel grant. Graduate College, the University of Iowa (\$2500)                | Aug. 2023 |
| Outstanding Employee Award, Augur Intelligence Technology LTD (\$280)          | Jan. 2022 |
| High-Level Talents 2021, Tianhe District, Guangzhou, Guangdong, China (\$7033) | Dec. 2021 |

College Scholarship (First-class, Second-class, third-class), Guangzhou University  
Outstanding Student Award, Guangzhou University

Sep. 2015 - Jun. 2017  
Sep. 2015

## RESEARCH EXPERIENCES

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### Climate-driven health vulnerabilities of rural well users

Aug. 2023 – Present

- Synthesized literature and developed a conceptual framework for social vulnerability to health risks posed by groundwater pollution.
- Investigated relationships among socio-demographic characteristics, nitrate pollution level on private wells and colorectal disease risks in Iowa with spatial regression models and interpretable machine learning model.

### Spatiotemporal Analysis of Public Sentiment with Twitter Data: A Case Study in New York

Aug. 2019 – Dec. 2019

- Conducted sentiment analysis based on Twitter data with a neural network model.
- Analyzed the spatial and temporal pattern of public happiness in New York City with a multivariate linear mixed-effect model.
- Developed a Web GIS Application to visualize the sentiment score on a map with adjustable periods and filters of land use categories.

## SOCIAL ENGAGEMENT

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### Science Core Heuristics for Open Science Outcomes in Learning (SCHOOL)

Dec. 2023 – Present

- Participated as a member of the open science team to review and provide feedback for lesson materials aiming to provide open, interactive, and interdisciplinary learning modules for open science.
- Receive training and attend workshops for NASA Transform to Open Science (TOPS) projects.

### CUHK Jockey Club AI for the Future Project – AI and Sustainability

Apr. 2023 – Aug. 2023

- Designed curriculum materials for AI and Sustainability courses to engage secondary school teachers with advanced and comprehensive AI knowledge in Hong Kong.
- Developed hands-on curriculum tutorial for practical AI model training with Python.

## SKILLS

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### Programming & Software

Python, PySAL, HTML & CSS & JavaScript, D3.js, ArcGIS, QGIS, PostGIS & PostgreSQL, GeoServer, R, SPSS, Revit, 3DsMax and Blender.

### Analytical Skills

Spatial Statistics, GIS-based Modeling, Web Mapping, interpretable Machine Learning, High-Performance Computing, Database Management Systems (DBMS).

## PATENTS

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Chen, M., Kong, X., Deng, M., **Cai, J.**, Liang, N., Huang, G. (2023). A Visualization Method and System for Big Data in Housing Risk Hazards (China. Patent No. CN116523378A) (pending)

**Cai, J.**, Chen, S., Chen, M., Li, D., Su, J., Xie, Q., Deng, M. (2022). Construction and Display Method of BIM Model Based on LOD (China. Patent No. CN114283231A) (pending)