

Jinyi Cai

+86 18826058626 | cjycathy@163.com

Guangzhou, Guangdong, China 510760

linkedin.com/in/jinyi-cai

PROFESSIONAL SUMMARY

2 years experience in design and development of web application focusing on the management and visualization of nation-wide spatial data for public administration;

4 years research and study experience in the collection, processes, and analysis of spatial data for geographic problems concerning land use management, crime and crisis management.

EDUCATION

• M.S. in Geospatial Information Science	3.94/4.00	Sep. 2019 - Dec. 2020
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Department of Geographical Sciences, University of Maryland

Courses: Web Programming, Mobile GIS, Spatial Database System, GIS and Spatial Modeling, Internet GIS, Spatial Analysis, Programming and Scripting for GIS, Spatial Statistics, etc.

• B.S. in Physical Geography, Resource & Environment (Major)	3.72/4.00	Sep. 2014 - Jun. 2018
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School of Geographical Science, Guangzhou University

Courses: Advanced Mathematics, Physical Geography, Humanistic Geography, Regional and Urban Planning, Land Management, land Ecology etc.

• B.A. in English (Minor)	3.35/4.00	Sep. 2015 - Jun. 2017
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School of Foreign Studies, Guangzhou University

Courses: Introduction to Linguistics, Translation Theory and Practice, English Literature, French as a Second Language Advanced English, Critical Thinking etc.

PROFESSIONAL EXPERIENCES

<u>Augur Intelligence Technology LTD</u>	WebGIS Developer	May.2020 to present
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Design and development of web application focusing on the survey, construction management, supervision and visualization of nation-wide rural house spatial data for public administration

- Web development: Developed web map system with Mapbox GL JS, ArcGIS JS API, Echarts and Threejs based on Vue framework to render 2D and 3D map scenes, display thematic maps and provide web base graphic editing.
- Spatial data processing: Automated thematic data process and analytics (IDW interpolation, hotspot analysis, and kernel density analysis) with python to manage large datasets (millions of features for 34 districts)
- Spatial data server managing: Published geographic data (WMTS, WMS, WFS, WFTS, mbtiles) on Geoserver and Tileservr for web mapping.
- 3d model processing: Transformed and processed BIM model into light binary data (gltf, 3dtiles) with 3ds Max, Revit and open-source code

<u>Shenzhen Lvyun Technology LTD</u>	E-Learning Designer	Mar. 2018 - Jun. 2018
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- Responsible for designing and teaching online courses for elementary school students, including video recording, editing with Camtasia and animation production, etc.

RESEARCH EXPERIENCES

Regression Analysis on the relation of predicted NPP and actual NPP with year, precipitation, land cover, topography and variability

Research assistant for Prof. Stephen D. Prince, University of Maryland, College Park, USA. Oct. 2019 - Dec. 2019

- Analyzed the relation of predicted NPP and actual NPP with year, precipitation, land cover, topography and variability with multiple linear regressions on a large spatial dataset using R.

Spatiotemporal Analysis of Public Sentiment with Twitter Data: A Case Study in New York, USA.

Capstone Project of M.S. University of Maryland, College Park, USA.

Sep. 2019 - Nov. 2019

- Analyzed and visualized sentiment distribution from twitter data to understand the spatial and temporal pattern of public happiness within New York City with a multivariate linear mixed-effect model.

- Retrieved the twitter data with Twitter Streaming API and cleaned with NLTK, Pandas, RE using Python. Implemented Sentiment analysis with TextBlob tool based on tokenization, lemmatization, and stemming
- Processed spatial data to acquire the land use categories of the tweets with ArcMap and ArcGIS Pro.
- Investigated the fixed effect of land use and time period to the sentiment score was with a multivariate linear mixed-effects model with lme4 package using R.
- Developed a Web GIS Application to visualize the sentiment score on map with the change of hours of the day and days of the week and filter of land use categories on Apache server using ArcGIS services, HTML, CSS, JavaScript, Mapbox GL JS and D3.js.

Analysis of the Spatial Distribution of Violent Crime in Washington D.C., USA

Course Project

Apr. 2019 - Jun. 2019

- Analyzed the spatial distribution of violent crime in Washington D.C with nearest neighbor analysis and kernel density estimation analysis using ArcMap. Result shown that the largest hotspot is located at the Cardozo-Shaw, Columbia Height and Park View neighborhoods and the minor one is located at the southeast area of Washington D.C., Anacostia neighborhood.

Comparison of Pattern and Mechanism of City Growth and Shrinkage in the Pearl River Delta Area: A Case Study in Dongguan and Zhongshan.

Thesis of B.S. Guangzhou University, Guangzhou, China.

Jan. 2018 - May. 2018

- Based on resident population, regional gross domestic product and the digital number of the nighttime light image, this paper builds the three analytical dimensions framework of population, economy and land and classifies towns in Dongguan and Zhongshan and analyzes the growth and shrinkage spatial pattern.

Report on the Translation of *Land Use and Society* from the Perspective of Skopos Theory.

Thesis of B.A. Guangzhou University, Guangzhou, China.

Jan. 2017 - May. 2017

- This report applies the Skopos Theory to the translation practice and revises the translation of *Land Use and Society*, a book of Land Resources Management, as a practice of the theory based translation of English for Science and Technology into Chinese

PATENTS

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). China National Intellectual Property Administration. (substantive examination)

Wang, J., Deng, M., **Cai, J.**, Fang, Y., Chen, M., Su, J., Xie, Q. (2022). Hierarchical LOD generation method, system and storage medium based on component semantic segmentation. (China. Patent No. CN115270237A). China National Intellectual Property Administration. (disclosed)

SOCIAL PRACTICES

Star Youth Development Center [Project Leader & Volunteer] Jan. 2017 - Apr. 2018

Responsible for the team management of **project research and planning** for the data collection of Reading Area Map including more than 700 reading activities in 11 districts in Guangzhou, China.

SKT Education Group – USAD&USAP [Judge & Volunteer] Feb. 2018 - Feb. 2018

Served as a judge of the **Assessment Center** at the United States Academic Decathlon & Pentathlon competition, grading student projects according to the 5C model (Critical Thinking, Creativity, Communication, Collaboration and Cultural Competency)

SKILLS

- Web development: proficient in **HTML, JavaScript, TypeScript, CSS, Vue** and **Echarts**, experience with **Angular** and **PHP**;
- Web digital cartography: familiar with **Mapbox, ArcGIS API for JavaScript**, experience with **D3, Leaflet** and **Cesium**;
- Mapping tools: skillful at **ArcMap, ArcGIS Pro, QGIS**, experience with **ENVI**;

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- Automating spatial data processing: familiar with **Python (numpy, pandas, geopandas, ogr, gdal, pyqgis, arcpy)** and skillful at **multiprocessing**, experience with **SPSS** and **R**;
 - Database and server: skillful at **GeoServer**, **Tileserver**, **mbtiles** and **PostgreSQL**, experience with **MySQL**;
 - 3D model processing: experience with **Revit**, **3DsMax** and **Blender**;

LANGUAGE

Language Mandarin, Cantonese – native, English – fluent, French – rudimentary

HONORS

Outstanding Employee Award, Augur Intelligence Technology LTD	Jan. 2022
College Scholarship (First-class, Second-class, third-class), Guangzhou University	Sep. 2015 - Jun. 2017
Student Business Plan Competition Award (Second-class), Guangzhou University	Mar. 2016
Outstanding Student Award, Guangzhou University	Sep. 2015