Jinyi Cai

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PROFESSIONAL SUMMARY

3 years of experience in web and mobile application development focusing on web mapping.

4 years of research experience in analyzing and modeling spatial data for geographic problems.

EDUCATION

• **M.S. in Geospatial Information Science**   **3.94**/4.00   Sep. 2019 - Dec. 2020

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

School of Geographical Science, Guangzhou University

Courses: Advanced Mathematics, Technology and application of database, Visual Basic Programming, etc.

• **B.A**. **in English**   **(Minor)**   **3.35**/4.00   Sep. 2015 - Jun. 2017

School of Foreign Studies, Guangzhou University

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

PROFESSIONAL EXPERIENCES

Augur Intelligence Technology LTD   WebGIS Developer   May.2020 to present

- 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 scene, 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 Tileserver 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

Rural House Map Management System

- Developed web map system with Mapbox GL JS and Vue framework to display national thematic maps.
- Designed thematic maps concerning basic house information, house risk index, house management, etc. with different forms such as heatmaps, grid maps, bar charts, pie charts, etc.
- 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)

Rural House BIM System

- Developed web map system to render BIM, mountain, pipeline, tree and water models on a 3D map scene.
- Processed and optimized geographic data with ArcMap to produce base scene vector layers.
- Transformed and processed BIM model into light binary data (gltf, 3dtiles) with 3ds Max, Revit and open-source code.

National Risk Survey Web Map Application for Housing and Municipal Facilities

- Developed web base graphic editing toolset for house survey with ArcGIS JS API.
- Published geographic data (WMTS, WMS, WFS, WFTS) on Geoserver for web mapping.
- Visualized the statistical data with Echarts to display in bars and charts.

Shenzhen Lvyun Technology LTD   E-Learning Designer   Mar. 2018 - Jun. 2018

- Responsible for designing and teaching online courses for elementary school student, including video recording, editing with Camtasia and animation production, etc.

PROJECT EXPERIENCES

NYC Public Sentiment Map Web Application   Sep. 2019 - Nov. 2019
- Retrieved the Twitter data and processed it with a natural language processing model.
- Designed and visualized the spatial and temporal distribution of public happiness in New York City for a typical week by developing a web application.

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.

Reading Map Web Application   May. 2018 - Jun. 2018
- Website design for bookstore lover to find the locations of bookstores and cultural activities information.
- Integrated Leaflet Map API to display the location of the bookstores

The user can act as a contributor to record bookstores or activities.

PATENTS

Jinyi Cai, Shunqing Chen, Minghua Chen, Danyang Li, Jianye Su, Quan Xie, Mingliang Deng. Construction and display method of BIM model based on LOD: China, CN114283231A[P]. 2022-04-05 (substantive examination)

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

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

Course Porject

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

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

(Thesis of B.A.) Guangzhou University, Guangzhou, China.   Jan. 2018 - May. 2018

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)

LANGUAGE

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

SKILLS

- Web development: proficient in **HTML, JavaScript, TypeScript, CSS, Vue** and **Echarts**, experienced with **Angular** and **PHP**;
- Web digital cartography: familiar with **Mapbox**, **ArcGIS API for JavaScript,** experienced with **D3, Leaflet** and **Cesium**；
- Mapping tool: skillful at **ArcMap, ArcGIS Pro, QGIS,** experienced with **ENVI**;
- Automating spatial data processing: familiar with **Python (numpy, pandas, geopandas, ogr, gdal, pyqgis, arcpy)** and skillful at **multiprocessing,** experienced with **SPSS** and **R**；
- Database and server: skillful at **GeoServer**, **Tileserver**, **mbtiles** and **PostgreSQL,** experienced with **MySQL**；
- 3D model processing: experienced with **Revit, 3DsMax** and **Blender**；

HONORS

Outstanding Employee Award, Augur Intelligence Technology LTD	Jan. 2022
High-Level Talents, issued by Guangzhou Tianhe District	Dec. 2021
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