Jinyi Cai

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RESEARCH INTERESTS

spatial temporal data analysis, socio-spatial context and sentiment analysis;
mobility, migration; geo-visualization, open-source implementation

EDUCATION

• M.S. in Geospatial Information Science **3.94**/4.00 Sep. 2018 - Dec. 2019
Department of Geographical Sciences, University of Maryland, College Park, USA.

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

• B.A. in English (dual-degree) **3.35**/4.00 Sep. 2015 - Jun. 2018
School of Foreign Studies, Guangzhou University, Guangzhou, China

PROFESSIONAL EXPERIENCES

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

- 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 (over 10 million of features with attributes)
- 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

Center of Geo-Informatics for Public Security, Guangzhou University [Research Assistant] Jun. 2018 - Aug. 2018

- Assist in the host of 5th International Conference on Crime Geography and Crime Analysis

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 by sentiment analysis with LSTM neural network to understand the spatial and temporal pattern of public happiness within New York City with a multivariate linear mixed-effect model.
- 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 using ArcGIS services, 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, China.

Thesis of B.S. Guangzhou University, 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

Research on the teleconnection of transformation and reconstruction in urban villages and rural villages: A Case Study in Tuhua Village, China Nov. 2016 – Mar. 2017

Competition Research Guangzhou University, China

- Based on field investigation in urban villages and quantitative & qualitative analysis, this research constructed a framework of teleconnection to illustrate the transfer of population, money and techniques between urban villages and rural villages over time and revealed the reconstruction process in these areas.

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) (pending)

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) (pending)

Li, D., Deng, M., **Cai, J.**, Xie, Q., Fang, Y., Chen, M. (2022). Method, system, and medium for locating and rendering building information models in 3D environments. (China. Patent No. CN115496847A) (pending)

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 JS,** experience with **D3, Leaflet** and **Cesium**;
- Mapping tools: skillful at **ArcMap, ArcGIS Pro, QGIS,** experience with **ENVI**;
- 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**;

HONORS

Outstanding Employee Award, Augur Intelligence Technology LTD	Jan. 2022
High-Level Talents 2021, Guangzhou Tianhe District	Dec. 2021
Graduate with Honor, Joint MSGIS Program of University of Maryland and Nanjing Normal University	Dec. 2019
College Scholarship (First-class, Second-class, third-class), Guangzhou University	Sep. 2015 - Jun. 2017
Second Prize of Geoscience Exploration Competition, Guangzhou University	Mar. 2017
Student Business Plan Competition Award (Second-class), Guangzhou University	Mar. 2016
Outstanding Student Award, Guangzhou University	Sep. 2015

LANGUAGE

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