

Yifan SUN

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EDUCATION

Department of Geography, University of Washington | Seattle, US

● *Ph.D.* in Geography Sept., 2020- Jun. 2025

School of Resources and Environmental Science, Wuhan University | Wuhan, China

● *M.S* in Surveying and Mapping Engineering Sept., 2018- Jun., 2020

● *B.S* in Geographic Information Science Sept., 2014- Jun., 2018

RESEARCH INTERESTS

Geographic misinformation (theory/social implication/detection); Critical Remote Sensing; GeoAI; Social Geocomputation

PUBLICATIONS

Zhao, B., Zhang, S., Xu, C., **Sun, Y.**, & Deng, C. 2021. Deep fake geography? When geospatial data encounter Artificial Intelligence. *Cartography and Geographic Information Science*, 1-15.

Sun, Y., Ma, A., Su, H., Su, S., Chen, F., Wang, W., Weng, M., 2020. Does the establishment of development zones really improve industrial land use efficiency? Implications for China's high-quality development policy. *Land Use Policy*, 104265.

Sun, Y., Li, J., Jin, X., Xiao, H., He, Z., Su, S., Weng, M., 2019. Intra-urban excessive alcohol drinking: Geographic disparities, associated neighborhood characteristics and implications for healthy city planning. *Sustainable Cities and Society*, 46, 101414.

Su, S., **Sun, Y.**, Lei, C., Weng, M., Cai, Z., 2017. Reorienting paradoxical land use policies towards coherence: A self-adaptive ensemble learning geo-simulation of tea expansion under different scenarios in subtropical China. *Land Use Policy*, 67, 415-425.

Pi, J., **Sun, Y.**, Xu, M., Su, S., Weng, M., 2016. Neighborhood Social Determinants of Public Health: Analysis of Three Prevalent Noncommunicable Chronic Diseases in Shenzhen, *Social Indicators Research*, 135, 683-698.

Sun, Y., Zhao, M., Liu, Z., Lin, H., Zhang, K., Chen, B., 2017. Evaluation Indexes and Empirical Research on the Rationality of Layout of First-aid Sites. *Journal of Medical Informatics*, 38, 48-53. (*In Chinese*)

Sun, Y., Zhao, M., Zhang, K., Chen, B., Lin, H., Lu, C., 2017. Bibliometric Analysis of Medical Geographic Information System Research. *Medical information*, 30, 53-56. (*In Chinese*)

RESEARCH EXPERIENCES

Public fact-checking platform for satellite imagery

HGIS Lab – University of Washington

Spet. 2020- Current

- Pilot study: first critic the potential threatens of deepfake technology abuse for satellite image. In the published paper, we first show the procedure to creating authentic-look fake satellite images using CycleGAN, then we develop a deepfake detection model based on SVM and self-defined features (not use DNN because we want to explicitly understand the difference between real and fake satellite images). This study received intensive coverage from dozens of media outlets (i.e Defense One, Global Times).
- Current focus: Currently, our research focus is to build up a public fact-checking platform for satellite imagery based on two consideration: 1. The authenticity of satellite image is not binary opposition (truths instead of one single Truth), we can't discuss this issue without social-context and power relationship; 2. The rise of AI include but not limited to deepfake making auto/semi-auto manipulation of satellite images unprecedentedly easy and hard to distinguish. The platform contains three key components: manipulation auto-detection, auxiliary discriminant information framework, public opinions module. For the first component, we intend to develop a large-scale fake satellite images benchmark dataset taking multi-categories of faking (i.e, both manual and AI fake, global color/style transformation, local object elimination and addition) into considering, then a DNN based model which take spatial-temporal information into consideration are likely to be built.

Placial misinformation: Case study of fake restaurant reviews

HGIS Lab – University of Washington

Jan. 2021- Current

- Develop a fake review detection approach which taken the nearby geographic information into consideration based on the hypothesis that spatial competition and local customer flow will significantly affect the use of fake reviews by restaurants.

- Theorize fake reviews on Yelp/Google as placial misinformation generated by intentional geographic practice towards place causing cognitive inconsistency, then take fake restaurant reviews as an example, further explore to what extent people's GIS mediated experience towards place is influenced by placial misinformation, and what's the mechanism behind the influence.

Sustainable Land Use Planning: Urban Form, Tea Expansion and Industrial Land Use Efficiency

Urbanization Research Laboratory of Wuhan University

Spet., 2017-Apr. 2020

- Put forward an innovative conceptual framework, looking in depth at the effect of fiscal incentives and admittance criterion of development zones in industrial land use efficiency.
- Summarize and compare different measures of industrial land use efficiency, and proposed a usage-based method selection framework.
- Assisted to simulate the tea expansion under different policy scenarios using a innovative self-adaptive cellular automaton model based on ensemble learning.
- Mode of construction land were analyzed from six aspects including intensity, direction, type, landscape, multicentricity and boundary.

Urban and Social Justice: Chronic Diseases, Alcohol Abuse, Street Walkability

Urbanization Research Laboratory of Wuhan University

Oct., 2016- Jun., 2018

- Established a conceptual framework for intra-urban excessive alcohol drinking occurrence, which combined social deprivation, neighborhood physical environment and Chinese wine culture.
- Assisted to identified neighborhood social determinants of three prevalent non-communicable chronic diseases in Shenzhen, using spatial regression models, and furthered discussed their importance through random forest algorithm.
- Assisted to establish an innovative indicator system for street walkability auditing.

Other research experience: Spatial optimization model; traffic flow simulation; transportation-oriented development; street view analysis and style transfer; remote sensing image interpretation and landscape index calculation

WORK EXPERIENCES

ByteDance- E-commerce Business Department- Full Stack Data Scientist

Mar., 2021-Spet., 2021

- **User Label:** Design, train and deploy XGBoost model to generate user conversion labels and beauty preference labels; In addition, a batch - automatic training deployment framework for user transformation labels is designed and implemented.**Live**
- **GMV Prediction:** Participated in the design and implementation of GMV prediction model and expected achievement risk model of e-commerce live room; the former reached the leading level of the industry; independently wrote a patent and participated in writing a patent in this process.
- **Thematic Analysis:** Commodity correlation analysis; E-commerce activity name decision support analysis; Head live-room conflict analysis; Incremental GMV analysis of marketing tools.

OTHER INFORMATION

Selected Software Development Projects

Individual developer / Project Assistants | GISoft Laboratory of Wuhan University

Mar., 2017- Present

- *Integral Analysis System of National Geographical Conditions (NGC-IAS)- (Large-scale Desktop GIS system)* : Key member of the development team of *NGC-IAS*, independently responsible for the development of land expansion simulation toolbox and landscape index calculation toolbox.
- *Online Maps of Wuhan University- (Web App/ Android App)*: Key member of the development team of *Official Map System of Wuhan University*, serving for the back-end development and fully responsible for the maintenance and upgrading of the system. Based on the aforementioned system, led a team of ten people to further develop *Luyou*, an official mobile map APP with functions such as map search, panoramic roaming, and voice guide.
- *OSpider- (desktop toolbox/python lib)*: Open-source geographic data acquisition and preprocessing software/package, 2000+ individual users and 100+ stars on GitHub. <https://github.com/skytruine/OSpider>

Additional Information: Python/SQL as current main coding language, familiar with ML/DL, experienced in graphic and UI design, familiar with mathematic modelling.