Xuezhi Cang
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EDUCATION:

2014-2021 ABD. in Geography. Northern Illinois University, DeKalb, IL. GPA: 3.73/4.0 (PhD expected May 2021)

2020-2021 M.S., Computer Science. Northern Illinois University, DeKalb, IL GPA: 3.83/4

2011-2014 M.S., Geographic Information System. Capital Normal University, China. GPA: 90/100

2006-2010 B.S., Geography Information System. Nanjing Normal University, China.

WORKING ANF RESESARCH EXPERIENCES:

Summer GIS intern Illinois State Water Survey, Midwestern Regional Climate Center May 2018 - Aug 2018

Pulled temperature and tornado tracks data from web services, made Python script to clean and calculate the ranking information from those data, visualized them using ArcPy Mapping and built a web map using ArcGIS APIs.

Research and teaching assistant Northern Illinois University, DeKalb, IL Aug 2014 – Present

Extracted landform features (valley networks and junction angle) from Mars DEM (a type of grid data) using ArcPy and Python and presented in several top journals (*Nature communications* and *EPSL*); published a new spatial analysis method in a top GIS journal (*IJGIS*) and utilized this method to analyze the landform features of Mars.

Taught and designed GIS and image processing labs.

SKILLS:

Spatial analysis:

- **Spatial thinking**: Published a new spatial analysis method on the top-rated GIS journal (*IJGIS*); Applied spatial analysis methods to human and physical geography research projects and published the research results on several academic journals (such as *EPSL* and *Nature communications*)..
- **ArcGIS desktop**: More than 10-year experience; Taught ArcGIS Desktop labs in several universities; Applied analysis tools of ArcGIS Desktop to complete several spatial research and published papers in human and physical geography research; Developed an automatic mapping tool for saving half the manually work in a responsibility area mapping project;
- **Other GIS software**: Familiar with image classification of remote sensing data using ERDAS, ENVI and Google Earth Engine; Utilized several models in Grass GIS (such as Geomorphon) to process DEM data for research; Analyzed spatial data in GeoDa, Alteryx and Tableau for spatial calculation and visualization.

Programming:

- **Python:** Familiar with GIS related Python libraries such as ArcPy, PySAL and GDAL; Computed the freeze ranking and comparison of the pulled historical climate data from 1815 to 2017 for the MRCC; Mapped more than 150 freeze related thematic maps automatically using ArcPy.Mapping; Implemented a valley networks (VNs) extraction program by using ArcPy to the global Mars DEM dataset; Implemented a river junction angle calculation and analysis program using ArcPy and scikit-learn to process millions of streams lines; Handled with large data processing using multiprocessing.
- **MATLAB:** Implemented Zhang's calibration algorithm and computed the parameters of camera; Built Mono-vision SLAM using MATLAB; Applied bag-of-words model to detect loop closure.
- **Web mapping:** familiar with ArcGIS WebAPI and Mapbox API; Built a HTML webpage visualizing pulled historical climate data using ArcGIS Web APIs.
- **Parallel Computation**: Implemented a parallel computation program to extract the stream order using Python multiprocessing; Used the Gaea system (a high performance computer) for big data research tasks.
- **Others:** Used Java to implement the R-tree and KNN in Biological Image Classification and Annotation Tool; Implement several GIS spatial operations (overlapping, map projection, etc) using C++.

Cartographic Skills:

- **Mapping:** Generated hundreds of maps in courses projects and real projects.
- **Map design**: Designed and digitized the Xu Xiake travel scientific popularization electronic map.
- **Map digitalization**: Led a 10 people term for the contour lines digitalization project.

AWARDS

2020 Dissertation Completion Fellowships of Northern Illinois University ($ 14000)

2018, 2020 Richard E. Dahlberg Memorial Scholarship of Northern Illinois University ($500, $300)

2019 Student Scholarship of Illinois GIS Association ($1000)

2019 Outstanding Graduate Student Award of Northern Illinois University

PUBLICATIONS

- **Cang, X**., Luo, W., 2019. Noachian Climatic Conditions on Mars Inferred from Valley Network Junction Angles. Earth and Planetary Science Letters. 526, p.115768. (IF = 4.637)
- Luo, W., Howard, A.D., **Cang, X.**, 2019. Comment on "The volume of water required to carve the Martian valley networks: Improved constraints using updated methods." Icarus (IF = 3.565)
- **Cang, X.**, Luo, W., 2018. Spatial association detector (SPADE). Int. J. Geogr. Inf. Sci. 32, 2055–2075. (IF = 3.545)
- Luo, W., **Cang, X.**, Howard, A.D., 2017. New Martian valley network volume estimate consistent with ancient ocean and warm and wet climate. Nat. Commun. 8, 15766. (IF = 11.878)
- Luo, W., Jasiewicz, J., Stepinski, T., Wang, J., Xu, C., **Cang, X.**, 2016. Spatial association between dissection density and environmental factors over the entire conterminous United States. Geophys. Res. Lett. 43, 692–700. (IF = 4.578)
- Li, H., Zhang, A., Hu, S., Huang, H., **Cang, X**., Sun, W., 2015. New Remote Sensing Image Subpixel Registration of Spatial and Frequency Domain. J. Chinese Comput. Syst. 36, 591–596. (in Chinese)
- **Cang, X**., Tang, G., Zhong, T., Li, R., 2010. Classification of Peaks and Digital Expression of Their Spatial Pattern. J. Nanjing Norm. Univ. (Natural Sci. Ed). 33, 136–140. (in Chinese)
- Li, R., Teng, F., **Cang, X**., Tang, G., Li, F., 2010. Design of XU Xiake Travel Scientific Popularization Electronic Map. Geomatics World 3. (in Chinese)

COFERENCE

- **Cang, X.**, Luo, W., 2019. Utilizing Valley Network Junction Angle to Estimate the Duration of "Warm" Mars, in: 50th Lunar and Planetary Science Conference (2019).
- **Cang, X.**, Luo, W., 2017. Frequency Distribution of Junction Angles of Valley Networks on Mars Consistent with an Early Warm Climate, in: Fourth International Conference on Early Mars: Geologic, Hydrologic, and Climatic Evolution and the Implications for Life.
- **Cang, X.**, Luo, W., 2016. Spatial Association between Valley Density and Environmental Factors over the whole of Conterminous China, in: The 33rd International Geographical Congress.
- **Cang, X.**, Luo, W., 2016. An Improved Spatial Association Estimator under the Geographical Detector Model Using Monte Carlo Simulation, in: 2016 AGU Fall Meeting.
- **Cang, X.**, Luo, W., 2015. Area Measurement Errors in Equal-area Projection, in: 2015 AAG Annual Meeting.
- Zhong, T., **Cang, X.**, Li, R., Tang, G., 2009. Landform classification based on hillslope units from DEMs, in: 30th Asian Conference on Remote Sensing (ACRS) Proceedings.

BOOK CHAPTER:

- Luo, W., Hartmann, J., Wang, F., Pingwen, H., Sysamouth, V., Li, J., **Cang, X.**, 2018. GIS in Comparative-Historical Linguistics Research: Tai Languages, in: Comprehensive Geographic Information Systems. Elsevier, pp. 157–180.

INVITED TALKS

- Google Earth Engine: A Powerful Platform for Planetary-scale Research at GEOG 460 - Remote Sensing of the Environment (Apr 2019), DeKalb, IL
- SPADE: A Spatial Analysis Method Based on Variance Analysis at IL Municipal Arc Users Group Meeting, Romeoville, IL (Mar, 2019)
- Spatial Association Detector (SPADE) at GEOG 660 - Advanced Spatial Analysis class (Oct, 2019), DeKalb, IL

ACADEMIC PROFILES:

- Google scholar: https://scholar.google.com/citations?user=a3OHfGUAAAAJ&hl=en