Xuan Shi, Ph.D.
Department of Geosciences
University of Arkansas, Fayetteville, AR 72701

a. PROFESSIONAL PREPARATION

Institution	Location	Major	Degree and Year
Hubei University	Wuhan, Hubei, China	Geography	B.S. 1988
Indiana Univ. of Pennsylvania	Indiana, PA	Geography	M.S. 2001
West Virginia University	Morgantown, WV	Geography	Ph.D. 2007

b. APPOINTMENTS

- Adjunct faculty member, Department of Computer Science and Computer Engineering, University of Arkansas, 2017 – current.
- Core member, Institute of Advanced Data Analytics, University of Arkansas. 2017 – current.
- Assistant Professor, Department of Geosciences, University of Arkansas. 2012 – current.
- Research Scientist @ Center for GIS in Georgia Tech. 2007 – 2012
- GIS Programmer and Analyst in the West Virginia GIS Technical Center. 2001 – 2007
- Graduate Assistant, Department of Geography & Regional Planning, IUP. 1999 – 2001

c. PRODUCTS

Five products most closely related to the proposed project:

1. **Shi, X.** 2017. Parallelizing Affinity Propagation using GPUs for Spatial Cluster Analysis over Big Geospatial Data. In Griffith D., Chun Y., Dean D. (eds) Advances in Geocomputation: Proceedings of the Geocomputation 2015 – The 13th International Conference. pp. 355-369.
2. **Shi, X.** and Xue, B. 2016. Deriving a Minimum Set of Viewpoints for Maximum Coverage over Any Given Digital Elevation Model Data. International Journal of Digital Earth. Volume 9, Issue 12. pp. 1153-1167.
3. **Shi, X.** and Xue, B. 2016. Parallelizing maximum likelihood classification on computer cluster and graphics processing unit for supervised image classification. International Journal of Digital Earth.
http://www.tandfonline.com/doi/full/10.1080/17538947.2016.1251502
4. Guan, Q., **Shi, X.**, Huang, M., and Lai, C. 2016. A hybrid parallel cellular automata model for urban growth simulation over GPU/CPU heterogeneous architectures. International Journal of Geographical Information Science. Volume 30, Issue 3. pp. 494-514. DOI: 10.1080/13658816.2015.1039538
5. Huang, M., Lai, C., **Shi, X.**, Hao, Z. and You, H. 2015. Study of Parallel Programming Models on Computer Clusters with Intel MIC Coprocessors. International Journal of High Performance Computing Applications, April 2015. doi: 10.1177/1094342015580864

Five other significant products:

1. Lai, C., Huang, M. and **Shi, X.** 2016. SRC: Accelerating the Calculation of Minimum Set of Viewpoints for Maximum Coverage over Digital Elevation Model Data by Hybrid Computer Architecture and Systems. Proceedings of the 24th ACM SIGSPATIAL

International Conference on Advances in Geographic Information Systems. San Francisco, CA.

2. **Shi, X.**, Xue, B. and Xierali, I. 2015. Understanding the clustering patterns in physician distribution through Affinity Propagation. Proceedings of the 23rd International Conference on Geoinformatics. pages 320-323. Published by IEEE Xplore® Digital Library.
3. **Shi, X.**, Lai, C., Huang, M. and You, H. 2014. Geocomputation over the Emerging Heterogeneous Computing Infrastructure. Transactions in GIS, vol. 18, no. S1, pp. 3-24, Nov. 2014.
4. **Shi, X.**, Huang, M., You, H., Lai, C. and Chen, Z. 2014. Unsupervised image classification over supercomputers Kraken, Keeneland and Beacon. GIScience & Remote Sensing, Volume 51, Issue 3. 2014. pp. 321-338
5. **Shi, X.** and Ye, F. 2013. Kriging interpolation over heterogeneous computer architectures and systems. GIScience & Remote Sensing. Volume 50, Issue 2, 2013. pp.196-211

d. SYNERGISTIC ACTIVITIES

University of Arkansas, Department of Geosciences. I developed three GIS programming courses for students in geography and geographic information science programs at both undergraduate and graduate levels, covering the challenging topics on customized application by programming ArcObjects, ArcGIS server development using JS API, and geocomputational toolkit development by Python. Today, very few geography programs in the United States offer such advanced courses to students.

Scalable and high performance geocomputation. I am the first geographer and GIScientist to work on supercomputers Keeneland (a cluster of GPUs) and Beacon (a cluster of Intel's Xeon Phis) and have developed scalable and high performance geocomputation solutions. A series of peer reviewed papers are published in recent years highlighting the novel parallel and distributed algorithms for problem solving in geospatial science.

Supervisor of awarded student research competition. Under my supervision and advice, Chenggang Lai, my graduate research assistant, has won the 2nd Place award of the 2016 Robert Raskin Student Competition organized by the Cyberinfrastructure Specialty Group (CISG) of the Association of American Geographers (AAG), and the 2nd Place award of the 2016 ACM SIGSPATIAL Student Research Competition at the 24th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems.

Department of Energy (DOE) projects. As a co-investigator of two DOE projects on the potential extractable energy from the Nation's tidal streams and ocean currents along U.S. coast (2008-2012), I created novel solutions to embed MATLAB functional modules with ArcGIS Server Flex API to enable online simulation and validation of energy potential modeling. This solution was thought impossible by other DOE investigators and program officers, and thus was highly acclaimed when the project was in operation successfully.

Service to the scientific and engineering community. I have been providing services to varieties of academic societies and federal agencies, including Chair of the SOA, SOC, and Middleware Committee in AAG Cyberinfrastructure Specialty Group (CISG 2008-current), CISG Secretary (2008-1010), member of the Scientific Advisory Board and Programming Committee of Geocomputation 2013 and 2015, Co-Chair of the 2012 International Workshop on Modern Accelerator Technologies for GIScience, and member in the Review Panel for NSF and NASA.