CyberGIS Reading List

Big Geospatial Data

Evans, M. R., Oliver, D., Yang, K., & Shekhar, S. (2013). Enabling Spatial Big Data via CyberGIS: Challenges and Opportunities. *CyberGIS: Fostering a New Wave of Geospatial Innovation and Discovery. Springer Book* .

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Sui, D., & Goodchild, M. (2011). The convergence of GIS and social media: challenges for GIScience. *International Journal of Geographical Information Science* , *25* (11), 1737-1748.

Zikopoulos, P., & Eaton, C. (2011). *Understanding big data: Analytics for enterprise class hadoop and streaming data* . McGraw-Hill Osborne Media.

Background, Concepts and Characteristics of CyberGIS

Armstrong, M. P., Nyerges, T. L., Wang, S., & Wright, D. (2011). Connecting geospatial information to society through cyberinfrastructure. The SAGE Handbook of GIS and Society. London, Sage Publications, 109-22.

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Xing, J. (2011). IHC 3: An Integrated Hybrid Cloud Computing Cyberinfrastructure for GIS/RS Research. In *Masters Abstracts International* (Vol. 51, No. 04).

Yang, C., Goodchild, M., Huang, Q., Nebert, D., Raskin, R., Xu, Y., & Fay, D. (2011). Spatial cloud computing: how can the geospatial sciences use and help shape cloud computing? *International Journal of Digital Earth* , *4* (4), 305-329.

Yang, C., Raskin, R., Goodchild, M., & Gahegan, M. (2010). Geospatial cyberinfrastructure: past, present and future. *Computers, Environment and Urban Systems* , *34* (4), 264-277.

Zhang, Q., Cheng, L., & Boutaba, R. (2010). Cloud computing: state-of-the-art and research challenges. *Journal of internet services and applications* , *1* (1), 7-18.

CyberGIS Technologies

Anselin, L. (2012). From SpaceStat to CyberGIS twenty years of spatial data analysis software. *International Regional Science Review* , *35* (2), 131-157.

Lee, C., & Percivall, G. (2008). Standards-based computing capabilities for distributed geospatial applications. *Computer* , *41* (11), 50-57.

Nyerges, T. L., Roderick, M. J., & Avraam, M. (2013). CyberGIS design considerations for structured participation in collaborative problem solving. *International Journal of Geographical Information Science* , *27* (11), 2146-2159.

Wang, S. (2013). CyberGIS: blueprint for integrated and scalable geospatial software ecosystems. *International Journal of Geographical Information Science* , *27* (11), 2119-2121.

Zhang, T., & Tsou, M. H. (2009). Developing a grid-enabled spatial Web portal for Internet GIServices and geospatial cyberinfrastructure. *International Journal of Geographical Information Science* , *23* (5), 605-630.

CyberGIS Algorithms and Methods

Guan, Q., Kyriakidis, P. C., & Goodchild, M. F. (2011). A parallel computing approach to fast geostatistical areal interpolation. International Journal of Geographical Information Science, 25(8), 1241-1267.

Liu, Y. Y., & Wang, S. (2014). A scalable parallel genetic algorithm for the generalized assignment problem. Parallel Computing.

Rey, S. J. (2014). Fast algorithms for a space-time concordance measure. Computational Statistics, 29(3-4), 799-811.

Rey, S. J., Anselin, L., Pahle, R., Kang, X., & Stephens, P. (2013). Parallel optimal choropleth map classification in PySAL. International Journal of Geographical Information Science, 27(5), 1023-1039.

Shi, X., & Ye, F. (2013). Kriging interpolation over heterogeneous computer architectures and systems. GIScience & Remote Sensing, 50(2), 196-211.

Shook, E., Wang, S., & Tang, W. (2013). A communication-aware framework for parallel spatially explicit agent-based models. International Journal of Geographical Information Science, 27(11), 2160-2181.

Tang, W., Wang, S., Bennett, D. A., & Liu, Y. (2011). Agent-based modeling within a cyberinfrastructure environment: a service-oriented computing approach. *International Journal of Geographical Information Science* , *25* (9), 1323-1346.

High Performance Geospatial Computing for Scientific Discoveries

Chen, B., Huang, F., Fang, Y., Huang, Z., & Lin, H. (2010). An approach for heterogeneous and loosely coupled geospatial data distributed computing. *Computers & geosciences* , *36* (7), 839-847.

Clematis, A., Mineter, M., & Marciano, R. (2003). High performance computing with geographical data. *Parallel Computing* , *29* (10), 1275-1279.

Fujioka, E., Berghe, E. V., Donnelly, B., Castillo, J., Cleary, J., Holmes, C., & Halpin, P. (2012). Advancing Global Marine Biogeography Research with Opensource GIS Software and Cloud Computing. *Transactions in GIS* , *16* (2), 143-160.

Fustes, D., Cantorna, D., Dafonte, C., Arcay, B., Iglesias, A., & Manteiga, M. (2014). A cloud-integrated web platform for marine monitoring using GIS and remote sensing. Application to oil spill detection through SAR images. *Future Generation Computer Systems* , *34* , 155-160.

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Li, Q., Zhang, T., & Yu, Y. (2011). Using cloud computing to process intensive floating car data for urban traffic surveillance. *International Journal of Geographical Information Science* , *25* (8), 1303-1322.

Li, W., Li, L., Goodchild, M. F., & Anselin, L. (2013). A geospatial cyberinfrastructure for urban economic analysis and spatial decision-making. *ISPRS International Journal of Geo-Information* , *2* (2), 413-431.

Padmanabhan, A., Wang, S., Cao, G., Hwang, M., Zhang, Z., Gao, Y., & Liu, Y. (2014). FluMapper: A cyberGIS application for interactive analysis of massive location-based social media. *Concurrency and Computation: Practice and Experience* .

Welch, M. C., Kwan, P. W., & Sajeev, A. S. M. (2014). Applying GIS and high performance agent-based simulation for managing an Old World Screwworm fly invasion of Australia. *Acta tropica* .

Yang, C., & Raskin, R. (2009). Introduction to distributed geographic information processing research. *International Journal of Geographical Information Science* , *23* (5), 553-560.

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Content Title	Module 1. CyberGIS Reading List
Content Type	Reading List
Part Of	Module 1: Fundamentals of CyberGIS
Learning Objectives	(for all of Module 1) By the end of the semester, the students will be able to ◦ Understand the important concepts and principles used in the Cyberinfrastructure and CyberGIS research communities. ◦ Have a relatively comprehensive overview of the CyberGIS framework with all the key elements and their structuring. ◦ Widen their vision of GIS in the emerging paradigm of big data driven research.
Background Knowledge	(for all of Module 1) Basic concepts and terminology of GIS and computing (e.g. data processing, programming, algorithm)
Resources Needed	(for all of Module 1) Theoretical module; no requirement on hardware or software
Work Mode	(for all of Module 1) Watching the lectures in person and reading assigned articles
Relation to Project	(for all of Module 1) This module is designed to lay the basic theoretical foundation for CyberGIS as a scientific discipline and to prepare students for more advanced topics such as High Performance Geocomputing.

Feedback Needed	(for all of Module 1) General feedback