

# LIPING YANG

## Curriculum Vitae

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Department of Geography  
Penn State University  
University Park, PA 16802

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## ACADEMIC APPOINTMENTS

**Postdoctoral Researcher** **Fall 2016 – present**  
GeoVISTA Center, Department of Geography and Institute for CyberScience  
Penn State University

**Visiting Scholar** **June 2017 – July 2017**  
CISL (Computational Information Systems Laboratory), Mesa Lab  
NCAR (National Center for Atmospheric Research)

**Research Assistant** **Fall 2015 – Summer 2016**  
School of Computing and Information Science  
University of Maine

## RESEARCH INTERESTS

- GIScience, Big Spatiotemporal Data Analytics, Geospatial Analysis and Modeling, Geovisualization
- Deep Learning, Machine Learning, Visual Analytics, Image Analysis
- Natural Hazards, Indoor Navigation

## EDUCATION

**Ph.D., Spatial Information Science and Engineering** **2010 – 2015**  
University of Maine **Orono, USA**  
Ph.D. Advisors: Dr. Michael Worboys and Dr. Kate Beard  
Dissertation Title: *Theories and models of indoor space*

**M.Sc., Cartography and Geographic Information Systems (GIS)** **2006 – 2009**  
Fujian Normal University **Fuzhou, China**  
M.Sc. Advisors: Dr. Guangfa Lin and Dr. Youfei Chen  
Thesis Title: *Auto-match between text and map based on Chinese word segmentation: A case study of land use policy text*

**B.Sc., Geographic Information Systems (GIS)** **2002 – 2006**  
Yunnan Normal University **Kunming, China**  
Thesis Title: *Design and development of transport information system based on MapObjects: A case of Kunming City*

## PUBLICATIONS

### Manuscripts Under Review

1. **Yang, L.** and Cervone, G. Analysis of remote sensing imagery for disaster assessment using deep learning: a case study of flooding event. Submitted to the *GeoInformatica* in mid-March 2018.
2. Yang, N., MacEachren, A. M., and **Yang, L.** TIN-based tag map layout. Submitted to *Information Visualization* in mid-February 2018.
3. Pan, Y., Zhang, X., Cervone, G., and **Yang, L.** Detection of road pavement potholes and cracks based on the unmanned aerial vehicle multispectral imagery. Submitted to the *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing* in early February 2018.

### Manuscripts in Preparation

(A few papers integrating GIScience, Remote Sensing, Visual Analytics, Machine Learning and Deep Learning, which have been led by Liping Yang, are on the way.)

### Refereed Research Papers

1. **Yang, L.**, MacEachren, A. M., Mitra, P., and Onorati, T. Visually-enabled active deep learning for (geo) text and image classification: a review. *ISPRS International Journal of Geo-Information*, 7(2), 65, 2018.
2. **Yang, L.** and Worboys, M. Generation of navigation graphs for indoor space. *International Journal of Geographical Information Science*, 29(10): 1737-1756, 2015.
3. **Yang, L.** and Worboys, M. A navigation ontology for outdoor-indoor space. *Third ACM SIGSPATIAL International Workshop on Indoor Spatial Awareness (ISA 2011)*, November, Chicago, IL. 2011.
4. Ma, J., Lin, G., Chen, J. and **Yang, L.** An improved topographic wetness index considering topographic position. *Geoinformatics, 18th International Conference*. IEEE, 2010.
5. Lin, L., Lin, G., Yan, X., **Yang, L.**, Yang, Z. and Chen, A. Surface modeling of human population on subdistrict scale using SPOT5 image and census data: A case study of Xiamen, PR China. *Geoinformatics, 18th International Conference*. IEEE, 2010.
6. **Yang, L.**, Lin, G., Chen, A., Chen, Y., and Wen, X. A spatio-temporal data model for administrative division place names: A case study of Xiamen. *Proceedings of the 6th International Symposium on Digital Earth (ISDE6): Digital Earth in Action*, Organized by International Society for Digital Earth (ISDE) and Chinese Academy of Sciences(CAS), Beijing, P. R. China, September 9-12, 2009.
7. **Yang, L.**, Lin, G. and Chen, Y. Color processing methods of different seasonal SPOT5 images before mosaic. *Remote Sensing Technology and Application*, 24(2): 140-145, 2009. (in Chinese)

8. You, L., Lin, G., Yang, C., Lin, Q. and **Yang, L.** The effects of spatial scales on landscape indices – a case study of the landuse pattern of Xiamen island. *Geo-Information Science*, 10(1): 74-79, 2008. (in Chinese)
9. Jiao, Y. and **Yang, L.** Multi-scale research on the fractal beauty of Hani terrace based on remote sensing and geographic information system. *Journal of Mountain Science*, 26(3): 339-346, 2008. (in Chinese)
10. Jiao, Y. and **Yang, L.** The fractal characteristics of Hani terrace in Ailao mountain. *Acta Ecologica Sinica*, 27(11): 4583-4589, 2007. (in Chinese)

### Invited Talks

1. Introduction to Deep Learning with TensorFlow (with hands-on tutorial: using TensorFlow for image classification on NCAR HPC cluster), invited talk, *NCAR SEA Class and Hands-on Workshop: Spark and TensorFlow*, NCAR (National Center for Atmospheric Research), Boulder, CO. June 2017.
2. What is Deep Learning, invited talk, *the Geospatial Data Science Workshop (GDS 2017)* at Penn State University, University Park, PA. February 2017.

### Posters, Short Papers, and Talks (not Included Above)

1. **Yang, L.**, Cervone, G., MacEachren, A. M., Mitra, P., and Baka J. Visually-enabled Image and Text Analysis Using Machine Learning and Deep Learning. Poster presentation at the *Penn State ICS Symposium 2018: Harnessing the Power of Data*. Penn State University, University Park, PA. March 2018.
2. **Yang, L.** A unified OI-space navigation model supporting seamless navigation between and within built indoor and outdoor spaces. Doctoral colloquium talk at the *Conference on Spatial Information Theory (COSIT 2013)*, September, Scarborough, UK. 2013.
3. **Yang, L.** A navigation ontology for outdoor-indoor space. Poster presentation at the *UMaine Graduate Expo*, April 2012, University of Maine.
4. **Yang, L.** and Worboys, M. Similarities and differences between outdoor and indoor space from the perspective of navigation. Poster presentation at the *Conference on Spatial Information Theory (COSIT 2011)*, September, Belfast, ME. 2011.
5. **Yang, L.** A unified informatic framework supporting seamless navigation within built indoor and outdoor spaces. Doctoral colloquium talk at the *Conference on Spatial Information Theory (COSIT 2011)*, September, Belfast, ME. 2011.

## RESEARCH GRANTS

### Externally Funded Grants

June 2017                      Experiments with TensorFlow and Apache Spark on Cheyenne and Yellowstone Supercomputers for Image Classification and Segmentation, **Liping Yang (PI)**, Guido Cervone (CoPI), NCAR/CISL Summer Research Grant.

- May 2017 NVIDIA GPU Grant Proposal, **Liping Yang (PI)**, Guido Cervone (CoPI), Alan M. MacEachren (CoPI), NVIDIA awarded one Titan X Pascal GPU card to support research for big geospatial data challenges using machine learning and deep learning.
- 2016 – 2018 Fusing Social Media and Aerial Radiological Measurements of Study CBRNE Emergencies, Guido Cervone (PI), **Liping Yang (Postdoc)**, ONR (N00014-16-1-2543).
- 2015 – 2016 Perception of indoor scene layouts by machines and visually impaired users, Kate Beard (PI), **Liping Yang (Postdoctoral Research Assistant)**, NSF (CDI-1028895).
- 2010 – 2014 Information integration and human interaction for indoor and outdoor spaces, Michael Worboys (PI), **Liping Yang (Graduate Research Assistant)**, NSF (IIS-0916219).

### **Internally Funded Grants**

- 2017 – 2018 Comment Analytics: Leveraging Big Unstructured Data to Understand Spatial and Temporal Variations in Public Response to Government Policy, Alan M. MacEachren (PI), Jennifer Baka (CoPI), Prasenjit Mitra (CoPI), **Liping Yang (Postdoc)**, Internal (Penn State) Institute for CyberScience Seed Grant.

## **TEACHING**

### **Penn State University, Department of Geography**

- Spring 2018 Guest Instructor, GEOG 597 Big Data & Place  
Invited lecture: Tweet analysis about places using machine learning with Python (brief machine learning theory and hands-on tutorials).
- Fall 2017 Co-Instructor, GEOG 461W Dynamic Cartographic Representation  
Develop course syllabus with Dr. Alan MacEachren.  
Instruct programming for web development and design.  
Prepare lab instructions and lab quizzes.  
Mentor students on coding for web mapping final projects.  
Lead selected course discussions and give lecture on user-centered design.

### **University of Maine, School of Computing and Information Science**

- Fall 2011 & Fall 2012  
Assisted Dr. Michael Worboys in the course SIE505 Formal Foundations for Information Science.

## **HONORS AND AWARDS**

- 2014 – 2015 Michael J. Eckardt Dissertation Fellowship in MEIF (Maine Economic Improvement Fund) Areas, University of Maine, USA
- 2010 – 2014 Graduate Research Assistantship, University of Maine, USA

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|------|---|
| 2011 | ACM SIGSPATIAL GIS 2011 NSF Student Travel Grants, USA    |
| 2010 | ACM SIGSPATIAL GIS 2010 NSF Student Travel Grants, USA    |
| 2005 | Yunnan Province Government Scholarship (Top level), China |
| 2004 | National Scholarship (Top level), China                   |

## **PROFESSIONAL SERVICE & ASSOCIATIONS**

### **Reviewer (Journals)**

International Journal of Geographical Information Science (IJGIS)

### **Internal Service**

Reviewer, Penn State Institute for CyberScience Seed Grant Proposal, Spring 2017

Judge, EMS graduate poster competition, Spring 2017, Penn State University

### **Membership of Professional Societies**

- 2016 – present Member of International Association of Chinese Professionals in Geographical Information Sciences (CPGIS)
- 2016 – present Education Committee Member of CPGIS
- 2016 – present Member of Association of American Geographers (AAG)

## **COMPUTER SKILLS**

- **GIS:** ArcGIS, ArcObjects, ArcGIS Engine, QGIS, ERDAS Imagine, PCI, IDRISI.
- **Programming languages:** C/C++, Java, Python, JavaScript, C#, Visual Basic.NET, Octave, Prolog, NetLogo.
- **Database:** ESRI Geodatabase, Microsoft SQL Server, MySQL, MongoDB, SQLite, PostgreSQL, PostGIS.
- **Document and web markup languages:** LaTeX, XML, HTML.
- **3D modeling:** Unity3D, Blender.
- **Statistics:** R, SPSS, S-PLUS.
- **Image processing:** Processing, OpenCV, Point Cloud Library, OpenNI, Kinect.
- **Machine learning and deep learning:** TensorFlow, Keras, Scikit-learn, Gensim, NLTK.
- **High performance computing:** Apache Hadoop, Apache Spark, OpenMP, MPI.
- **Geoparsing:** GeoTxt, GeoPy, GeoNames, Google Cloud Natural Language API.
- **Web development:** Django, Node.js, CSS, JavaScript, jQuery, AJAX, Bootstrap, D3.js, DC.js, Crossfilter.js, Leaflet.js, Turf.js, JSON, GeoJSON, TopoJSON, Mapbox, OpenStreetMap.
- **Version control tools:** Git, GitHub, Bitbucket.
- **Platforms:** Linux (Ubuntu, CentOS, Red Hat), Windows, Mac OS X.
- **General:** Microsoft Office Suite, Apache OpenOffice, LibreOffice.

- **Others:** Protégé, Adobe Photoshop.

## **REFERENCES**

Professor Michael Worboys (Ph.D. Advisor)  
School of Computing and Mathematical Sciences  
Queen Mary Court  
University of Greenwich  
Old Royal Naval College, Park Row, London SE10 9LS  
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Phone: +44 (0) 7944 704131  
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Professor Kate Beard (Ph.D. Co-Advisor)  
National Center for Geographic Information and Analysis  
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