

LIPING YANG

Curriculum Vitae

August 18, 2019

Mail Stop B256
Information Sciences group (CCS-3)
Los Alamos National Laboratory
Los Alamos, NM 87545

+1 (505) 665-1095
liping.yang@lanl.gov
Web: lipingyang.org
Blog: deeplearning.lipingyang.org

VISUAL VISITOR ANALYTICS



(Deep) machine learning and computer vision research blog monthly average pageviews around 7500+ (recent average monthly page 14,000+); total pageviews 235,283 from Mar 24, 2017 to August 18, 2019.

ACADEMIC APPOINTMENTS

Assistant Professor of Geographic Information Science
Department of Geography and Environmental Studies
The University of New Mexico

Starting January 2020

Postdoctoral Research Associate
Information Sciences Group (CCS-3)
Los Alamos National Laboratory (LANL)

November 2018 – present

Postdoctoral Researcher
GeoVISTA Center, Department of Geography and Institute for CyberScience
The Pennsylvania State University

September 2016 – August 2018

Visiting Scholar
CISL (Computational Information Systems Laboratory), Mesa Lab
NCAR (National Center for Atmospheric Research)

June 2017 – July 2017

Postdoctoral Research Assistant
School of Computing and Information Science
The University of Maine

September 2015 – August 2016

RESEARCH INTERESTS

- Geographic Information Science (GIScience), Geospatial Big Data Analytics, Geospatial Modeling and Remote Sensing, Geovisualization
- Deep Learning, Machine Learning, Computer Vision, Image Analysis, Visual Analytics
- Natural Hazards, Indoor Navigation, Scene Understanding

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*
Degree Confer Date: 2015/08/21

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*
Degree Confer Date: 2009/06/30

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*
Degree Confer Date: 2006/06/30

PUBLICATIONS

[Google Scholar Profile](https://scholar.google.com/citations?user=HttiszsAAAAJ&hl=en) (<https://scholar.google.com/citations?user=HttiszsAAAAJ&hl=en>)

Peer Reviewed Research Papers

1. **Yang, L.**, Oyen, D., and Wohlberg, B. Image classification using topological features automatically extracted from graph representation of images. *Proceedings of the 15th International Workshop on Mining and Learning with Graphs (MLG)*. Anchorage, Alaska, August 2019.
2. **Yang, L.**, Oyen, D., and Wohlberg, B. A Novel Algorithm for Skeleton Extraction From Images Using Topological Graph Analysis. In *the IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019 Workshop on Deep Learning for Geometric Shape Understanding*. Long Beach, California, June 2019.
3. **Yang, L.** and Cervone, G. Analysis of remote sensing imagery for disaster assessment using deep learning: a case study of flooding event. *Soft Computing*. 2019.
<https://doi.org/10.1007/s00500-019-03878-8> (**has 202 downloads on the journal website as of 2019/08/18.**)

4. Yang, N., MacEachren, A. M., and **Yang, L.** TIN-based tag map layout. *The Cartographic Journal*. 2019. <https://doi.org/10.1080/00087041.2018.1533294>
5. **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. **(has 3493 views, 2761 downloads, and 10 citation as of 2019/08/18. It is ranked as top 5 most viewed paper among the papers published within 2 years on the journal website.)**
6. Pan, Y., Zhang, X., Cervone, G., and **Yang, L.** Detection of Asphalt Pavement Potholes and Cracks Based on the Unmanned Aerial Vehicle Multispectral Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, (99): 1-12, 2018. **(cited by 6 as of 2019/08/18, Google Scholar)**
7. MacEachren, A. M., Caneba, R., Chen, H., Cole, H., Domanico, E., Triozzi, N., Xu, F., and **Yang, L.** Is This Statement About A Place? Comparing two perspectives (Short Paper). In *LIPICs-Leibniz International Proceedings in Informatics* (Vol. 114). Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik, 2018.
8. Simpson, M., Wallgrün, J. O., Klippel, A., **Yang, L.**, Garner, G., Keller, K., Oprean, D., and Bansal, S. "Immersive analytics for multi-objective dynamic integrated climate-economy (DICE) models." In *Proceedings of the 2016 ACM companion on interactive surfaces and spaces*, 99-105. ACM, 2016. **(cited by 11 as of 2019/08/18, Google Scholar)**
9. **Yang, L.** and Worboys, M. Generation of navigation graphs for indoor space. *International Journal of Geographical Information Science*, 29(10): 1737-1756, 2015. **(cited by 53 as of 2019/08/18, Google Scholar)**
10. **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. **(cited by 59 as of 2019/08/18, Google Scholar)**
11. Ma, J., Lin, G., Chen, J. and **Yang, L.** An improved topographic wetness index considering topographic position. *Geoinformatics, 18th International Conference*. IEEE, 2010. **(cited by 14 as of 2019/08/18, Google Scholar)**
12. 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.
13. **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. **(cited by 1 as of 2019/08/18, Google Scholar)**
14. **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) **(cited by 3 as of 2019/08/18, Google Scholar)**

15. 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) **(cited by 16 as of 2019/08/18, Google Scholar)**
16. 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) **(cited by 4 as of 2019/08/18, Google Scholar)**
17. Jiao, Y. and **Yang, L.** The fractal characteristics of Hani terrace in Ailao mountain. *Acta Ecologica Sinica*, 27(11): 4583-4589, 2007. (in Chinese) **(cited by 5 as of 2019/08/18, Google Scholar)**

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. **(cited by 16 as of 2019/08/18, Google Scholar)**
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.

INVITED TALKS

1. Enhancing GIScience and Remote Sensing Using GeoAI, Research Computing Center & Mansueto Institute for Urban Innovation, The University of Chicago, Chicago, IL, July 2018.
2. Introduction to Deep Learning with TensorFlow (with hands-on tutorial: using TensorFlow for image classification on NCAR HPC cluster), *NCAR SEA Class and Hands-on Workshop: Spark and TensorFlow*, NCAR (National Center for Atmospheric Research), Boulder, CO. June 2017.
3. What is Deep Learning, *the Geospatial Data Science Workshop (GDS 2017)* at Penn State University, University Park, PA. February 2017.

RESEARCH GRANTS

Externally Funded Grants

- June 2017 **Liping Yang (PI)**, Guido Cervone (CoPI), NCAR/CISL Summer Research Grant, Experiments with TensorFlow and Apache Spark on Cheyenne and Yellowstone supercomputers for image classification and segmentation.
- May 2017 **Liping Yang (PI)**, Guido Cervone (CoPI), Alan M. MacEachren (CoPI), NVIDIA GPU Grant Proposal, NVIDIA awarded one Titan X Pascal GPU card to support research for big geospatial data challenges using machine learning and deep learning.
- 2016 – 2018 Guido Cervone (PI), **Liping Yang (Postdoc)**, ONR, Research Grant, Proposal number: N00014-16-1-2543, Fusing social media and aerial radiological measurements of study CBRNE emergencies.
- 2015 – 2016 Kate Beard (PI), **Liping Yang (Postdoctoral Research Assistant)**, NSF, Research Grant, Proposal number: CDI-1028895, Perception of indoor scene layouts by machines and visually impaired users.
- 2010 – 2014 Michael Worboys (PI), Nicholas Giudice (CoPI), **Liping Yang (Graduate Research Assistant)**, NSF, Research Grant, Proposal number: IIS-0916219, Information integration and human interaction for indoor and outdoor spaces.

Internally Funded Grants

- 2020 – 2022 Diane Oyen (PI), **Liping Yang (CoPI)**, Brendt Wohlberg, DOE LANL Laboratory Directed Research & Development (LDRD), Exploratory Research (ER), Research Grant, Proposal number: 20200041ER, Topological relation-based image analysis using graphs, \$927,000.
- 2017 – 2018 Alan M. MacEachren (PI), Jennifer Baka (CoPI), Prasenjit Mitra (CoPI), **Liping Yang (Postdoc)**, Internal (Penn State) Institute for CyberScience Seed Grant, Comment analytics: Leveraging big unstructured data to understand spatial and temporal variations in public response to government policy.

TEACHING AND MENTORING

LANL, Information Sciences Group

- **Summer 2019 Advised three summer intern graduate students for the Applied Machine Learning summer school**
 - Catherine Potts (3rd year Ph.D. student, Department of Mathematical Sciences, Montana State University)
 - Ming Gong (2nd year Ph.D. student of Electrical Engineering, University of Dayton)
 - Manish Bhattarai (3rd year Ph.D. student, Department of Electrical and Computer Engineering, University of New Mexico)

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
- 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

NSF proposal review (2018 – present)

Journals reviewed:

- *International Journal of Geographical Information Science* (IJGIS) [2016 – present]
- *ISPRS International Journal of Geo-Information* (ISPRS IJGI) [2018 – present]
 - Other journals [2018 – present]: *Remote Sensing; Sensors; Machine Learning and Knowledge; Entropy; Information; Sustainability; Journal of Hydrology; Regional Studies*

Conference Program Committee

- *International Conference on Computer Vision (ICCV) 2019 Workshop: Scene Graph Representation and Learning*

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 – 2017 Member of International Association of Chinese Professionals in Geographical Information Sciences (CPGIS)
- 2016 – 2017 Education Committee Member of CPGIS
- 2016 – 2017 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, Shell Scripting, C#, Visual Basic.NET, Octave, Prolog, NetLogo.
- **Database:** MySQL, MongoDB, SQLite, PostgreSQL, PostGIS, ESRI Geodatabase, Microsoft SQL Server.
- **Document and web markup languages:** LaTeX, XML, HTML.
- **3D modeling:** Unity3D, Blender.
- **Statistics:** R, SPSS, S-PLUS.
- **Image processing:** OpenCV, Scikit-image, NetworkX, Processing, Point Cloud Library, OpenNI, Kinect.
- **Machine learning and deep learning:** TensorFlow, Scikit-Learn, Keras, NumPy, Pandas, Matplotlib, Xarray, IPython, Jupyter Notebook, Gensim, NLTK, Conda, Virtualenv, Amazon Mechanical Turk (MTurk) crowdsourcing data Requester.
- **High performance computing:** Apache Spark, OpenMP, MPI, Microsoft Azure cloud computing, Apache Hadoop.
- **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, Highcharts.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
UK
Phone: +44 (0) 7944 704131
Email: M.Worboys@greenwich.ac.uk

Professor Kate Beard (Ph.D. Co-Advisor)
National Center for Geographic Information and Analysis
School of Computing and Information Science
The University of Maine
Orono, ME 04469-5711
USA
Phone: (207) 581-2147
Email: kate.beard@maine.edu

Professor Alan MacEachren (Postdoc Primary Supervisor)
Department of Geography
The Pennsylvania State University
University Park, PA 16802
USA
Phone: (814) 865-7491
Email: maceachren@psu.edu

Professor Guido Cervone (Postdoc Co-Supervisor)
Department of Geography
The Pennsylvania State University
University Park, PA 16802
USA
Phone: (814) 863-0179
Email: cervone@psu.edu

Dr. Diane Oyen (Postdoc Mentor)
Information Sciences group (CCS-3)
Los Alamos National Laboratory
Los Alamos, NM 87545
USA
Phone: (505) 667-2088
Email: doyen@lanl.gov

Dr. Brendt Wohlberg (Postdoc Co-Mentor)
Theoretical Division (T-5)
Los Alamos National Laboratory
Los Alamos, NM 87545
USA
Phone: (505) 667-6886
Email: brendt@lanl.gov