# LAURA G. TATEOSIAN

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## RESEARCH INTERESTS

Mapping for the common good, text mining, geospatial analytics, data visualization, gaze-contingent displays.

## EDUCATION

Ph.D. in Computer Science, North Carolina State University, 2006. Advisor: Dr. Chris Healey
Doctoral Thesis: Investigating aesthetic visualizations.
M.S. in Computer Science, North Carolina State University, 2002. Advisor: Dr. Chris Healey
Master's Thesis: Non-photorealistic visualization of multidimensional datasets
M.S. in Mathematics, University of Oklahoma, 1997
B.A. in Mathematics, Towson University, 1992

## PROFESSIONAL APPOINTMENTS

2019 - present, Associate Teaching Professor of Geospatial Analytics, NC
2018 - 2019, Assistant Teaching Professor of Geospatial Analytics, NC
2017 - 2018, Assistant Research Professor of Geospatial Information Science, NC
2010 - 2017, Research Assistant Professor of Geospatial Information Science, NC State University
2008 - 2010, Research Associate of Geospatial Information Science, NC State University
2007 - 2008, Postdoctoral Research Associate of Geospatial Information Science, NC State University
2001 - 2006, Research Assistant, NC State University
1999 - 2000, Instructor, Shippensburg University

## RESEARCH GRANTS AND TECHNOLOGICAL INNOVATIONS

Tateosian, L. U.S. Deptartment of Agriculture (USDA) Forest Service. "Tools to address market and policy challenges to successful timber harvests, thinnings, and fuel treatments for the wildfire crisis strategy.' ($426,500).

Ristaino, J., Carbone, I., Ojiambo, P., Jones, C., Zering, K., **Tateosian, L.**, Wei, Q., Vatsavai, R., Meentemeyer, R., and Delborne, J., 2022. National Science Foundation. "PIPP Phase I: Real-time Analytics to Monitor and Predict Emerging Plant Disease." ($1,000,000).

Hipp, A., Deepti, A., **Tateosian, L.**, Bocarro, J., and Huang, J. 2022. NC State University Data Science Academy Seed Grants. "Social media mining to inform park use and public health decision-making." ($32,417).

Baran, P. and **Tateosian, L.**, 2018. Wake County Government. "Geo-IDEAs: Geo-Innovation, DEveloping Analytic Solutions for Wake County." ($20,000).

**Tateosian, L.**, 2017. Laboratory for Analytic Sciences. "Visualizing conflict economies: Interactive Web-maps for exploring potential human trafficking data." ($76,000).

Ristaino, J., **Tateosian, L.**, 2017. Triangle Center for Evolutionary Medicine. "Population genomics and geospatial analytics to track the evolution and emergence of Phytophthora infestans." ($20,000).

**Tateosian, L.**, 2016. Laboratory for Analytic Sciences. "Sense-making: Temporal Story-Telling

Maps." ($74,163).

**Tateosian, L.**, 2015-2016. DELTA Exploratory Grant. "Py4All" ($8,000).

**Tateosian, L.**, 2015. Laboratory for Analytic Sciences. "Sense-making: Developing a story telling map generator" ($66,351).

**Tateosian, L.**, 2014-2015. Laboratory for Analytic Sciences. "Narrative Processing: Gaze-based interactive reading and mapping." ($91,616).

**Tateosian, L.**, Mitasova, H., and Overton, M., 2011. Renaissance Computing Institute (RENCI) at NC State. "Visualization of Terrain Evolution: from Animations to Space-Time Cube" ($12,000).

Devine, H., and **Tateosian, L.**, 2007-2008. US National Park Service. "Decision Support System for the Northeast and National Capital Region Fire Programs (CESU)" ($134,350).

**Tateosian, L.**, and Chopra, P., "GazeGIS", NC State University Invention Disclosure (May 2015).

## PUBLICATIONS

### Peer Reviewed Journal and Conference Articles

Knowles, J., Dietrich, J., Elkut, A., Puelo, J., Shi, F., **Tateosian, L.** "Ranges of Peak Storm Tides between Open-Coast and Bay Locations" in *Journal of Geophysical Research: Oceans*, in press.

Saffer, A., **Tateosian L.**, Saville, A., Yang, Y. and Ristaino, J., 2024. "Reconstructing historic and modern potato late blight outbreaks using text analytics.", *Scientific Reports*, 14(1), p.2523.

Vivek Nanda, V. M., Baran, P., **Tateosian, L.** "Classification of tree forms in aerial LiDAR point clouds using CNN for 3D tree modelling," *International Journal of Remote Sensing*, 44:22, 7156-7186, DOI: 10.1080/01431161.2023.2282405.

Montgomery, K. Walden-Schreiner, C., Saffer, A., Jones, C., Seliger, B.J., Worm, T., **Tateosian L.**, Shukunobe, M., Kumar, S., Meentemeyer, R., "Forecasting global spread of invasive pests and pathogens through international trade," *Ecosphere*, (Dec, 2023) 14:2.

**Tateosian, L.**, Saffer, A., Walden-Shreiner, C., Shukunobe, M. "Plant pest invasions, as seen through news and social media." *Computers, Environment and Urban Systems*, 100 (2023): 101922.

Schrum Jr, P., Jameson, C. D., **Tateosian, L.**, Blank, G., Wegmann, K., and Nelson, S."Curvature Weighted Decimation: A Novel, Curvature-Based Approach to Improved LiDAR Point Decimation of Terrain Surfaces," *Geomatics* 3, no. 1 (2023).

White, C. T., Petrasova, A., Petras, V., **Tateosian, L.**, Vukomanovic, J., Mitasova, H., & Meentemeyer, R. K. "An open-source platform for geospatial participatory modeling in the cloud." *Environmental Modelling  Software* 167 (2023): 105767.

Ristaino, J., Anderson, P., Bebber, D., [and 14 others, including **Tateosian, L.**] "The Persistent Threat of Emerging Plant Disease Pandemics to Global Food Security", *Proceedings of the National Academy of Sciences* 118 no. 23 (2021).

Huang, J.H., Floyd, M.F., **Tateosian L.**, Hipp A.J. "Exploring public values through Twitter data associated with urban parks pre- and post- COVID-19." *Landscape and Urban Planning*. 2022 Nov;227:104517. doi: 10.1016/j.landurbplan.2022.104517. Epub 2022 Jul 26. PubMed PMID: 35966883; PubMed Central PMCID: PMC9358034.

Yoshizumi, A., Coffer, M., Collins, E., Gaines, M., Gao, X., Jones, K., McGregor, I., McQuillan, K., Perin, V., Worm, T., Tomkins, L., and **Tateosian, L.**, A Review of Geospatial Content in IEEE Visualization Publications, In *2020 IEEE Visualization Conference (VIS)*. arXiv preprint arXiv:2009.03390.

Vivek Nanda, V. M., **Tateosian, L.**, Baran, P. "GIS-Based Estimation of Seasonal Solar Energy Potential for Parking Lots and Roads, *IEEE Greentech Conference Proceedings 2020*, (Apr. 2020): 136-141.

**Tateosian, L.**, Glatz, M., and Shukunobe, M. "Story-telling maps generated from semantic representations of events." *Behaviour & Information Technology* 39.4 (2020): 391-413.

Kozik, P., **Tateosian, L.**, Healey, C. G., and Enns, J. T. "Impressionism-Inspired Data Visualizations are both functional and beautiful." *Psychology of Aesthetics, Creativity, and the Arts* (2019).

Walden-Shreiner, C., Leung, Y., **Tateosian, L.** "Digital Footprints: Incorporating Crowdsourced Geographic Information for Protected Area Management" *Applied Geography* 90 (2018): 44-54.

**Tateosian, L.**, Guenter, R., Yang, Y. and Ristaino, J. "Tracking 19th century late blight from archival documents using text analytics and geoparsing." In Free and open source software for geospatial (FOSS4G) conference proceedings, 17.1 (2017): 146-155.

**Tateosian, L.**, Reza Amindarbari, Christopher Healey, Pavel Kozik, and James Enns. "The Utility of Beautiful Visualizations." In Free and Open Source Software for Geospatial (FOSS4G) Conference Proceedings, 17.1 (2017): 156-162.

**Tateosian, L.**, Tabrizian, P. "Blending tools for a Smooth Introduction to 3D Geovisualization." *In IEEE Visualization Workshop, Pedagogy of Data Visualization Workshop (PDVW) Proceedings* (Oct. 2017).

**Tateosian, L.**, Glatz, M., Shukunobe, M., and Chopra, P. (2017) "GazeGIS: A Gaze-based Reading and Dynamic Geographic Information System." *Burch M., Chuang L., Fisher B., Schmidt A., Weiskopf D. (eds) Eye Tracking and Visualization. ETVIS 2015. Mathematics and Visualization*, Springer Berlin Heidelberg (2016). Springer, Cham. pp. 129-147.

**Tateosian, L.**, Mitasova, H., Thakur, S., Hardin, E., Russ, E., and Blundell, B. (2013). "Visualizations of Coastal Terrain Time-series." *Information Visualization*, May 22, 2013.

Thakur, S., **Tateosian, L.**, Mitasova, H., Hardin, E., and Overton, M. (2013). "Summary Visualizations for Coastal Spatial-Temporal Dynamics." *International Journal for Uncertainty Quantification*, Vol. 3, No. 3, pp.241-253, 2013.

**Tateosian, L.**, Supak, S., Luo, H., Fang, K., Harrell, J., Harrelson, C., Bailey, A., and Devine, H. (2012). "Who's Watching Your Food? A Flexible Framework for Public Health Monitoring." *Transactions in GIS*, Vol. 16, No. 2, pp. 89-104, 2012.

## Books and Book Chapters

Mayorga, M., **Tateosian, L.**, Caltagirone, S., Velasquez, G., and Amindarbari, R. "Countering human trafficking using ISE/OR techniques." *Chapter In: Emerging Frontiers in Industrial and Systems Engineering: Growing Research and Practice* (2019) 237-257.

**Tateosian, L.** "Python for ArcGIS." *Springer, New York, NY* (2016).

Hardin, E., Mitasova, H., **Tateosian, L.**, and Overton, M. "GIS-based Analysis of Coastal Lidar Time-Series." *Springer, New York, NY* (2014).

## Other recognition

NC State News Release ("Using text analytics, scientists map the spread of potato blight prior to the Irish potato famine"). (2024). https://phys.org/news/2024-02-text-analytics-scientists-potato-blight.html

AAAS Eurika-Alert! News Release ("Plant disease: Mapping the spread of potato blight prior to the Irish potato famine"). (2024). https://www.eurekalert.org/news-releases/1034258

ScienceDaily News Release ("Using written records–and tweets–as a roadmap for plant disease spread"). (2024). http://sciencedaily.com/releases/2024/02/240215113544.htm

Medium article ("Reconstructing Historic and Modern Potato Late Blight Outbreaks Using Text Analytics"). (2024). https://redepapa.medium.com/reconstructing-historic-and-modern-potato-late-blight

NC State News Release (Tweets, News Offer Insights on Invasive Insect Spread). (2023). https://news.ncsu.edu/2023/01/tweets-news-offer-insights-on-invasive-insect-spread/

The GDELT Project ("Plant Pest Invasions, As Seen Through News And Social Media"). (2022). https://blog.gdeltproject.org/plant-pest-invasions-as-seen-through-news-and-social-media/

Center for Geospatial Analytics December 2019 Newsletter ("Partnership with Wake County a New Think (and Do) Tank for Harnessing Spatial Data") (2019) https://cnr.ncsu.edu/geospatial/news/2019/03/13/wake-county-spatial-data/

Center for Geospatial Analytics December 2016 Newsletter ("Taming Python  New Online Tool Helps Students Write Better Code" ) (2016). https://cnr.ncsu.edu/geospatial/news/2016/09/22/online-tool-helps-write-code/

Center for Geospatial Analytics December 2015 Newsletter ("MGIST Faculty Member Laura Tateosian Awarded DELTA Exploratory Grant"). (2015).https://cnr.ncsu.edu/geospatial/news/2015/10/05/mgist-laura-tateosian-delta-grant/

## Professional Meeting Presentations

Dunstan, C., **Tateosian**, L., Elliot Schwartz, and Hipp, A. "Quantifying and Analyzing Breakdancer Movements", presented at the Carnegie Mellon Sports Analytics Conference, Nov 1-2 (2024).

Yoshizumi, A. and **Tateosian, L.**, "A Review of Geospatial Content in IEEE Visualization Publications", presented at the 2020 IEEE Visualization Conference (VIS), Oct 28 (2020).

**Tateosian, L.**, Glatz, M., Shukunobe, M., and Chopra, P. (2015) "GazeGIS: A Gaze-based Reading and Dynamic Geographic Information System." Peer-reviewed paper, presented at the *First Workshop on Eye Tracking and Visualization in conjunction with IEEE Visualization Conference*, Chicago, IL, Oct 25, 2015.

**Tateosian, L.**, Glatz, M., and Shukunobe, M. (2015) "Expressive Maps for Story Telling." Poster presented at the *Showcase of 2015 LAS Activities*, Raleigh, NC, Dec 4, 2015.

Kanters, M., Bocarro, J., Edwards, M., **Tateosian, L.**, Hodge, C., McKenzie, T., and Floyd, M. (2013) "Neighborhood Income and Shared Use of School Physical Activity Facilities: Place Disparities Limit Participation in Afterschool Programs." Peer-reviewed poster, presented at the *Active Living Research Conference*, San Diego, CA, Feb. 26-28 2013.

Rouse, S., Bhosle, R., and **Tateosian, L.**, "Eye Tracking & ArcGIS: We can read your mind." Poster and digital application presented at the *NC GIS Conference*, Raleigh, NC, Feb. 7-8, 2013.

Thakur, S., **Tateosian, L.**, Mitasova, H. and Hardin, E., "Visualizing Coastal Tourism and Landscape Change." Peer-reviewed poster presented during the workshop on *Visualization Technologies to Support Research on Human-Environment Interactions*, organized by National Socio-Environmental Synthesis Center (SESYNC) Annapolis, MD, Jul. 23-24, 2012.

Thakur, S., **Tateosian, L.**, Hardin, E., Mitasova, H., and Overton, M. "Summary Visualizations for Coastal Spatial-Temporal Dynamics." Short paper presented at IEEE Working with Uncertainty Workshop at the *IEEE 2011 Visualization Conference*, Providence, Rhode Island, October 24, 2011.

**Tateosian, L.**, Thakur, S., Hardin, E., Mitasova, H., and Overton, M. (2011). "Visualizing Coastal Spatial-Temporal Dynamics." Peer-reviewed poster presented at *IEEE Information Visualization Conference*, Providence, RI, Oct. 23-28, 2011.

**Tateosian, L.**, Mitasova, H., Harmon, B. A., Fogleman, B., Weaver, K. and Harmon, R.S. "TanGeoMS: A Tangible geospatial modeling system." Full paper presented at the IEEE 2010 Visualization Conference, Salt Lake City, UT, Oct. 24-29, 2010.

Hagh-Shenas, H., Kim, S., **Tateosian, L.**, and Healey, C. G. (2009). "Multivariate Visualization of Continuous Datasets, a User Study." Peer-reviewed poster, presented at *IEEE Information Visualization Conference*, Oct. 11-15, 2009.

**Tateosian, L.**, Healey, C. G., and Enns, J. T. "Engaging Viewers Through Nonphotorealistic Visualizations." Full paper presented at the 5th International Symposium on Non-Photorealistic Animation and Rendering co-located with SIGGRAPH, San Diego, CA, Aug. 4-5, 2007.

## TEACHING EXPERIENCE

### Courses developed at NC State University

*Coding for Geospatial Applications*
Topic: Arming students to code for geosptatial application, primarily Python; also HTML, CSS, Javascript, and SQL.

*Geovisualization*
Topic: Best practices and tools for visualizing geospatial data.

*GIS Programming Fundamentals*
Topic: Streamlining GIS workflow with computer programming in the ArcGIS Python API.

*Principles of Geographic Information Science*
Topic: GIS algorithms, including geographic projections, raster and vector processing, networking and topology and computational geometry.

## Courses taught

*Graduate courses:* GIS Programming Fundamentals, Principles of Geographic Information Science, Geovisualization, Coding for Geospatial Applications, Visual Basic for GIS, GIS Databases

*Undergraduate courses at NC State University:* Coding for Geospatial Application

*Undergraduate courses at Shippensburg University:* Math for Critical Thinking, Algebra, Calculus

*Short courses:* Geospatial Analytics (Data Matters), Introduction to Python (Data Matters), Geoprocessing using Python (Customized Corporate Education)