

CONTACT INFORMATION	Work Address: 1 Bethel Valley Road Oak Ridge, TN 37830	Contact Information Work Phone: +1 (865) 576 9318 Email: mortonam@ornl.gov				
SUMMARY	Multidisciplinary Data Scientist with nine years of experience conceptualizing, designing, and developing data fusion, data mining, machine learning , and other statistical and mathematical methodologies used to solve real-world problems in a wide variety of domains.					
EXPERTISE	Modeling and Simulation, Optimization, Statistical Analysis, Software Development, Algorithm Development, Bayesian Statistics and Networks, GISystems, ArcGIS, R, Matlab, Python, C/C++, VB.Net, SQL, Microsoft Office					
EDUCATION	<p>University of Tennessee, Knoxville, Tennessee</p> <p>PhD, Data Science and Engineering, May 2021</p> <ul style="list-style-type: none"> • Advisor: Dr. Nicholas Nagle, PhD • GPA: 4.0/4.0 <p>California State Polytechnic University, Pomona, California</p> <p>Master of Science, Applied Mathematics, June 2013</p> <ul style="list-style-type: none"> • Advisor: Dr. Randall Swift, PhD • Co-Advisor: Dr. Robert N. Stewart, PhD • GPA: 3.9/4.0 <p>Bachelor of Science, Mathematics, June 2010</p> <ul style="list-style-type: none"> • GPA: 3.9/4.0 					
PROFESSIONAL EXPERIENCE	<p>Oak Ridge National Laboratory, Oak Ridge, Tennessee</p> <table border="0" style="width: 100%;"> <tr> <td style="padding-right: 20px;">Research Scientist</td> <td>July 2016 to Present</td> </tr> <tr> <td style="padding-right: 20px;">Research Associate</td> <td>September 2014 to July 2016</td> </tr> </table> <p><i>Geographic Data Sciences Group</i></p> <ul style="list-style-type: none"> • Develop and apply machine learning, data mining, computer vision, information retrieval, uncertainty quantification and other statistical and mathematical techniques used to solve technically complex problems in a wide variety of domains. • Independently develop and optimize new and existing machine learning and data mining algorithms to better analyze and extract value from geographic data. • Communicate complex technical information to decision makers and sponsors who are not familiar with methodology or technical aspects of the solution. • Collaborate with multidisciplinary teams on challenging interorganizational projects requiring a range of skills and expertise. • Disseminate theoretical research by publishing and presenting new methodologies and their applications in professional journals and relevant conferences. 		Research Scientist	July 2016 to Present	Research Associate	September 2014 to July 2016
Research Scientist	July 2016 to Present					
Research Associate	September 2014 to July 2016					

University of Geneva, Geneva, Switzerland

Research and Teaching Associate

June 2013 to June 2014

Multimedia Information Retrieval and Management Group

- Developed statistical machine learning models and interactive visualization tools in support of the data mining and knowledge discovery operations of archaeologists and epigraphists.
- Developed an improved information retrieval system for Mayan hieroglyphics by integrating expert knowledge into the retrieval process.
- Created assignments, delivered lectures, and provided feedback to Bachelor's and Master's students in computer science courses related to data structures, data mining, and information theory.

Oak Ridge National Laboratory, Oak Ridge, Tennessee

Research Associate

September 2012 to June 2013

Higher Education Research Experiences Intern

June 2012 to August 2012

Geographic Data Sciences Team

- Developed visualization software and analytical techniques allowing clients and sponsors to draw more meaningful conclusions from abstract geographic data sets.
- Enhanced population distribution and dynamics models by integrating relevant temporal, demographic and cultural factors into the modeling process.
- Helped end users better understand model results and limitations by providing appropriate visualizations of results and their associated uncertainties.

Jet Propulsion Laboratory, Pasadena, California

Research Associate

June 2011 to August 2011

Mechanical Systems Division

- Researched and implemented complex statistical model validation techniques to produce and validate stochastic spacecraft structural vibration models.
- Developed, tested, and documented a Matlab program designed to simulate and statistically compare numerical and experimental results for stochastic differential vibration models.
- Enhanced analytic effectiveness by creating graphs and other visualization tools to display simulations and facilitate the decision-making process.

Southern California Edison, Chino, California

Statistical Analyst

November 2010 to June 2012

Safety and Environmental Group

- Co-developed a time-series forecasting model to predict work hours for various organizations within Southern California Edison.
- Performed correlation and regression analysis to maximize the value of injury and incident-related data by identifying key relationships among variables.
- Developed Visual Basic macros and Access queries to automate and refine the validation process of regular and ad-hoc safety reports.

1. **Morton, A.**, Piburn, J.O. and Nagle, N.N. (2018). *Need A Boost? A Comparison of Traditional Commuting Models with the XGBoost Model for Predicting Commuting Flows*. In Proceedings of the 10th International Conference on Geographic Information Science (GIScience). Schloss Dagstuhl-Leibniz-Zentrum fuer Informatik.
2. Park, B.H., Aziz, H.M.A., **Morton, A.** and Stewart, R. (2018). *High performance data driven agent-based modeling framework for simulation of commute mode choices in metropolitan area*. In Proceedings of the 2018 21st International Conference on Intelligent Transportation Systems (ITSC).
3. **Morton, A.**, Piburn, J., Nagle, N., Aziz, H.M.A., Duchscherer, S. and Stewart, R. (2017). *A simulation approach for modeling high-resolution daytime commuter travel flows and distributions of worker subpopulations*. In Proceedings of the GeoComputation 2017 Conference, Leeds, England.
4. Piburn, J., Stewart, R., **Morton, A.** (2017). *An approximate entropy based approach for quantifying stability in spatio-temporal data with limited temporal observations*. In Proceedings of the GeoComputation 2017 Conference, Leeds, England.
5. Piburn, J., Stewart, R., Myers, A., Sorokine, A., Axley, E., Anderson, D., Burdette, J., Biddle, C., Hohl, A., Eberle, R., Kaufman, J. and **Morton, A.** (2017). *(WSTAMP): Further progress in discovering, exploring, and mapping spatiotemporal patterns across the world's largest open source data sets*. In Proceedings of the 2nd International Symposium on Spatiotemporal Computing, Cambridge, Massachusetts.
6. Piburn, J., Stewart, R. and **Morton, A.** (2017). *A simple spatially weighted measure of temporal stability for data with limited temporal observations*. In Proceedings of the 2nd International Symposium on Spatiotemporal Computing, Cambridge, Massachusetts.
7. **Morton, A.**, Piburn, J., Mcmanamay, R., Nagle, N. and Stewart, R. (2016). *A dasymetric-based monte carlo simulation approach to the probabilistic analysis of spatial variables*. In Proceedings of the Ninth International Conference on Geographic Information Science, Montreal, Canada.
8. Akasiadis, C., Panagidi, K., Panagiotou, N., Sernani, P., **Morton, A.**, Vetsikas, I., Mavrouli, L. and Goutsias, K. (2015). *Incentives for rescheduling residential electricity consumption to promote renewable energy usage*. In Proceedings of the SAI Intelligent Systems Conference 2015, London, United Kingdom.
9. **Morton, A.**, Nagle, N., Piburn, J., Stewart, R. and Mcmanamay, R. (2015). *A hybrid dasymetric and machine learning approach to high-resolution residential electricity consumption modeling*. In Proceedings of the GeoComputation 2015 Conference, Dallas, Texas.
10. Piburn, J., Stewart, R. and **Morton, A.** (2015). *Attribute Portfolio Distance: A dynamic time warping based approach to comparing and detecting common spatiotemporal patterns among multi-attribute data portfolios*. In Proceedings of the GeoComputation 2015 Conference, Dallas, Texas.
11. Stewart, R., Piburn, J., Weber, E., Urban, M. and **Morton, A.**, Thakur, G. and Bhaduri, B. (2015). *Can social media play a role in developing building occupancy curves for small area estimation?* In Proceedings of the GeoComputation 2015 Conference, Dallas, Texas.

12. **Morton, A.**, Marzban, E., Giannoulis, G., Patel, A., Aparasu, R. and Kakadiaris, I. (2014). *A comparison of supervised machine learning techniques for predicting short-term in-hospital length of stay among diabetic patients*. In Proceedings of the Workshop on Machine Learning for Predictive Models, Detroit, Michigan.
13. Osipyan, H., **Morton, A.** and Marchand-Maillet, S. (2014). *Fast interactive information retrieval with sample-based MDS on GPU architectures*. In Proceedings of the Information Retrieval Facility Conference, Copenhagen, Denmark.
14. Stewart, R., White, D., Urban, M., **Morton, A.**, Webster, C., Stoyanov, M., Bright, E. and Bhaduri, B. (2013). *Uncertainty quantification techniques for population density estimates derived from sparse open source data*. In Proceedings of the SPIE Geospatial InfoFusion III Conference, Baltimore, Maryland.

SELECTED
JOURNAL
PUBLICATIONS

1. DeRolph, C.R., McManamay, R., **Morton, A.** and Surendran Nair, S. (2019). City energysheds and renewable energy in the United States. *Nature Sustainability* (In Press).
2. Aziz, H.M.A., Nagle, N., **Morton, A.**, Hilliard, M.R., White, D.A. and Stewart, R.N. (2018). Exploring the impact of walkbike infrastructure, safety perception, and built-environment on active transportation mode choice: A random parameter model using New York City commuter data. *Transportation* 45, no. 5: 1207 - 1229.
3. Allen, M.R., Syed, Z., Chandola, V., **Morton, A.**, Brelsford, C., McManamay, R., KC, B., Sanyal, J., Stewart, R.N. and Bhaduri, B.L. (2018). A survey of analytical methods for inclusion in a new energy-water nexus knowledge discovery framework. *Big Earth Data* 2, no. 3: 197-227.
4. Aziz, H.M.A, Park, B.H., **Morton, A.**, Stewart, R.N., Hillard, M. and Maness, M. (2018). A high resolution agent-based model to support walk-bicycle infrastructure investment decisions: A case study with New York City. *Transportation Research Part C: Emerging Technologies*, 86, 280-299.
5. McManamay, R.A., Nair, S.S., DeRolph, C.R., Ruddell, B.L., **Morton, A.**, Stewart, R.N., Troia, M.J., Tran, L., Kim, H. and Bhaduri, B.L. (2017). US cities can manage national hydrology and biodiversity using local infrastructure policy. *Proceedings of the National Academy of Sciences*, 114, no. 36: 9581-9586.
6. **Morton, A.**, Nagle, N., Piburn, J., Stewart, R. N. and McManamay, R. (2017). A hybrid dasymmetric and machine learning approach to high-resolution residential electricity consumption modeling. *Advances in Geocomputation*.
7. Piburn, J., Stewart, R. and **Morton, A.** (2017). Attribute Portfolio Distance: A dynamic time warping-based approach to comparing and detecting common spatiotemporal patterns among multiattribute data portfolios. *Advances in Geocomputation*.
8. Stewart, R., Piburn, J., Weber, E., Urban, M., **Morton, A.**, Thakur, G. and Bhaduri, B. (2017). Can social media play a role in the development of building occupancy curves. *Advances in Geocomputation*.
9. Stewart, R., Urban, M., Duchscherer, S., Kaufman, J., **Morton, A.**, Thakur, G., Piburn, J. and Moehl, J. (2016). A bayesian machine learning model for estimating building occupancy from open source data. *Journal of the International Society for the Prevention and Mitigation of Natural Hazards*, 81, no. 3: 1929-1956..
10. Weng, L., Armsaleg, L., **Morton, A.** and Marchand-Maillet, S. (2014). A privacy-preserving framework for large-scale content-based information retrieval. *IEEE Transactions on Information Forensics & Security*, 10, no. : 152-167.

RECENT
PRESENTATIONS

1. **Morton, A.** (2019). *Wheres Wendy? Recent Advancements in the High-Resolution and Demographically Detailed UrbanPop Population Model and Database*. Presented at the 2019 Annual Meeting of the Association of American Geographers (AAG).
2. **Morton, A.** (2018). *Need A Boost? A Comparison of Traditional Human Commuting Models with the XGBoost Model for Predicting Commuting Flows*. Presented at the 10th International Conference on Geographic Information Science (GIScience).
3. **Morton, A.** (2018). *UrbanPop: A high-resolution population model for estimating daytime and nighttime subpopulations across the United States*. Presented at the 2018 Annual Meeting of the Association of American Geographers (AAG).
4. **Morton, A.** (2017). *Development of a Suite of Analytical Tools for Energy and Water Infrastructure Knowledge Discovery*. Presented at the 2017 American Geophysical Union (AGU) Annual Meeting.
5. **Morton, A.** (2017). *A Statistical Framework for Estimating Electricity Consumption Using Public Data*. Presented at the 2017 Grace Hopper Annual Conference for Women Technologists.

TECHNICAL
REPORTS

1. **Morton, A.**, Omitaomu, O.A., Kotikot, S.M., Held, E.L. and Bhaduri, B.L. (2018). Evaluation of Factors that Influence Residential Solar Panel Installations (No. ORNL/TM-2018/780). Oak Ridge National Laboratory, Oak Ridge, TN (United States).

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1. **Morton, A.**, Omitaomu, O. A. and Kotikot, S. (2018). Automatic Residential/Commercial Classification of Parcels with Solar Panel Detections (No. Auto Res/Comm Classification of Parcels; 005648IBMPC00). Oak Ridge National Laboratory, Oak Ridge, TN (United States).