

Curriculum Vitae

Amy N. Rose

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Contact Information

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Research Interests

I am a population research scientist in the Geographic Information Science and Technology (GIST) group at Oak Ridge National Laboratory (ORNL), and also serve as the Population and Land Use Theme Lead for the ORNL Urban Dynamics Institute (UDI). My focus is on the research and development of multiscale, high resolution spatiotemporal population distribution datasets, modeling scale-adaptive population futures and land cover conversion processes, and data fusion methods for global building characterization. I am particularly interested in characterizing the spatiotemporal and demographic patterns of populations to inform a variety of applications including urban resiliency, human health and security, and climate change impacts.

Education

Ph.D. Geography, The University of Tennessee (2015)

M.S. Geography / Logistics and Transportation, The University of Tennessee (2002)

Current Positions

Population and Land Use Theme Lead (2015-present), Urban Dynamics Institute, Oak Ridge National Laboratory, Oak Ridge, TN

As Theme Lead, I provide leadership for a multidisciplinary team of ORNL staff, post-docs, interns and students in order to deliver insights into the evolving sociodemographic patterns of human activity that respond to and transform urban landscapes and systems at varying spatial and temporal scales. Research by this team spans a wide spectrum of expertise including population research, land use characterization, spatial demography, remote sensing and imagery analytics, data fusion and mining, and critical infrastructure analysis.

Research Scientist (2007-present), Geographic Information Science and Technology Group, Oak Ridge National Laboratory, Oak Ridge, TN

My current research is focused on population dynamics and distribution, small area estimation, and spatiotemporal analysis. I am the co-developer of the LandScan Global Population Distribution Database, as well as the Principal Investigator for LandScan USA, which is a very high resolution population distribution database for the U.S. that includes diurnal and demographic variations. I am also co-developer for LandCast, a spatially explicit and locally adaptive population futures database. I routinely serve as a mentor for Oak Ridge Associated Universities (ORAU) research associates as well as students participating in the ASTRO, HERE, SULI, and RAMs summer intern programs.

Professional Experience

GIS Project Manager (2004 – 2007), The Shaw Group, Knoxville, TN

Functioned as the GIS group's technical lead for projects requiring the development of custom geospatial

applications and database management. Served as the GIS project lead for land use and transportation related planning projects. Worked with multi-disciplinary teams to provide technical solutions relating to Superfund (CERCLA) remedial investigation/feasibility study (RI/FS) and remedial design/remedial action (RD/RA) activities, RCRA Facility Investigations (RFI), and various environmental site assessments (ESA).

Research Associate, (1996 – 2004), The University of Tennessee Center for Transportation Research, Knoxville, TN

Performed in many capacities including Principle Investigator, Project Manager, Technical Leader, and Analyst. Cultivated working relationships with government and military organizations to provide technology-based solutions for transportation related issues. Responded to requests for proposals, and composed statements of work that included a research plan and forecasted budget requirements. Assembled and led project teams through design, development, and delivery of products including software utilities, databases, and business analysis.

Student Research Assistant (1995 – 1996), The University of Tennessee Systems Development Institute, Knoxville, TN

Worked on a team of researchers tasked by the Federal Highway Administration (FHWA) to develop the National Highway Planning Network (NHPN); a nationwide road network used by private and public sector organizations for traffic studies, routing, and other transportation planning purposes. Created a Linear Referencing System (LRS) for the NHPN by translating and conflating State-supplied data for all 50 States and Puerto Rico.

Honors and Awards

- 2015 Oak Ridge National Laboratory Significant Event Award – *Development of Unique High Resolution, Locally Adaptive, Spatially Explicit Population Projections for the U.S.*
- 2014 Oak Ridge National Laboratory Significant Event Award – *Development of the first ever government-owned foundation energy infrastructure data layer*
- 2014 UT-Battelle Technology Commercialization Award
- 2013 UT-Battelle Award for Excellence in Technology Transfer
- 2013 UT-Battelle Technology Commercialization Award
- 2008 Oak Ridge National Laboratory Significant Event Award – *Successful Establishment of ORNL as the Computational Lead for DARPA Foundation Program Next Generation Socio-technical Simulation*
- 2002 Association of American Geographers Citation Award for the Top Applied Geography Project of the Year - *Analysis of Defense Distribution Center (DDC) Supply Chain*

Peer Reviewed Publications

- Rose, A.N.**, Nagle, N.N. (in press). Validation of Spatiodemographic Estimates Produced Through Data Fusion of Small Area Census Records and Household Microdata. *Computers, Environment and Urban Systems*.
- McKee, J.J., **Rose, A.N.**, Bright, E.A., Huynh, T., & Bhaduri, B.L. (2015). Locally adaptive, spatially explicit projection of US population for 2030 and 2050. *Proceedings of the National Academy of Sciences*, 112(5), 1344-1349.
- Rose, A.N.**, Bright, E.A. (2014). The LandScan Global Population Distribution Project: Current State of the Art and Prospective Innovation. *Proceedings of the Population Association of America Annual Meeting*, Boston, MA.
- Jochem, W.C., Sims, K., Bright, E.A., Urban, M.L., **Rose, A.N.**, Coleman, P.R., & Bhaduri, B.L. (2012). Estimating traveler populations at airport and cruise terminals for population distribution and dynamics. *Natural Hazards*, 68(3), 1325-1342.
- Omitaomu, O.A., Blevins, B.R., Jochem, W.C., Mays, G.T., Belles, R., Hadley, S.W., Harrison, T.J., Bhaduri, B.L., Neish, B.S., **Rose, A.N.** (2012). Adapting a GIS-based multicriteria decision analysis approach for evaluating new power generating sites. *Applied Energy*, 96(0), 292-301.

Fernandez, S.J., **Rose, A.N.**, Bright, E.A., Beaver, J.M. Symons, C.T., Omitaomu, O.A. (2010). Construction of Synthetic Populations with Key Attributes: Simulation Set-up while Accommodating Multiple Approaches within a Flexible Simulation Platform. *IEEE Second International Conference on Social Computing (SocialCom)*, 701-706, Minneapolis, MN.

Presentations & Meetings

- Rose, A.N.**, Allen, M.R., Yuan, J., Branstetter, M.L., New, J.R., Omitaomu, O.A. (2016). *Modeling Urban Energy Use Scenarios at Neighborhood Resolution*, Association of American Geographers Annual Meeting, San Francisco, CA.
- Moehl, J.J., **Rose, A.N.**, Bright, E.A. (2016). *Towards a Global Buildings Database*, Association of American Geographers Annual Meeting, San Francisco, CA.
- Balkcom, T.C., Moehl, J.J., **Rose, A.N.**, Stewart, R.N. (2016). *Leveraging Street-Level Imagery to Model Heterogeneous Building Distribution in an Intraurban Context*, Association of American Geographers Annual Meeting, San Francisco, CA.
- Rose, A.N.** (2015). *Testing the Boundaries: The Impact of Subnational Boundary Quality on Population Distribution Datasets*, Association of American Geographers Annual Meeting, Chicago, IL.
- Bhaduri, B.L., Bright, E.A., **Rose, A.N.**, Liu, C., Urban, M.L., and Stewart, R.N. (2014). *Data driven approach for high resolution population distribution and dynamics models*. Proceedings of the 2014 Winter Simulation Conference, p842-850.
- Rose, A.N.**, Nagle, N.N. (2014). *Increasing the Demographic Resolution of Large Area Population Distribution Data*, Association of American Geographers Annual Meeting, Tampa, FL.
- Stewart, R.N., **Rose, A.N.**, Bright, E.A. (2014). *Spatial Analysis and Decision Assistance: A Free Program Integrating LandScan High Resolution Population Datasets with Advanced Spatiotemporal Risk-Based Decision Support Models*, Association of American Geographers Annual Meeting, Tampa, FL.
- Stewart, R.N., Bright, E.A., **Rose, A.N.**, McGinn, W., Bhaduri, B.L. (2013). *Enriching Risk Based Decision Support Models with Large Scale, High Resolution Population Data*, Society for Risk Analysis Annual Meeting, Baltimore, MD.
- Weber, E.M., Coleman, P.R., Bright, E.A., **Rose, A.N.** (2013). *Spatially Precise Accounting of Prisoner Populations in Nighttime Population Models*, Association of American Geographers Annual Meeting, Los Angeles, CA.
- Huynh, T.N., McKee, J.J., **Rose, A.N.**, Bright, E.A. (2013). *Spatially-Explicit Projection of the U.S. Population for 2030 and 2050: Developing County-Level Population Projections and Spatial Allocation Rates*, Association of American Geographers Annual Meeting, Los Angeles, CA.
- McKee, J.J., Huynh, T.N., **Rose, A.N.**, Bright, E.A. (2013). *Spatially Explicit Projection of U.S. Population: Spatial Distribution of U.S. Population Projections for 2030 and 2050*, Association of American Geographers Annual Meeting, Los Angeles, CA.
- Sorokine, A., Myers, A.T., Liu, C., Bright, E.A., **Rose, A.N.**, Nugent, P.J., Bhaduri, B.L. (2012). *Tackling BigData: Strategies for Parallelizing and Porting Geoprocessing Algorithms to High-Performance Computational Environments*, 7th International Conference on Geographic Information Science, Columbus, OH.
- Bright, E.A., **Rose, A.N.**, Weber, E.M., Moehl, J.J. (2012). *Data Conflation to Improve the Spatio-temporal Resolution of Population Distribution Models*, Association of American Geographers Annual Meeting, New York, NY.
- Sims, K.M., Bright, E.A., **Rose, A.N.** (2012). *Raster Analysis using the LandScan Population Distribution Database: Issues & Solutions*, Association of American Geographers Annual Meeting, New York, NY.
- Bright, E.A., Cheriyyadat, A.M., Bhaduri, B.L., Urban, M.L., **Rose, A.N.**, Graesser, J.B. (2011). *Data Driven Characterization of Human Activities*, American Society for Photogrammetry and Remote Sensing Annual Conference, Milwaukee, WI.
- Rose, A.N.**, Bright, E.A., and Bhaduri, B.L. (2011). *On Uncertainty Assessment of Population Distribution Databases*, Association of American Geographers Annual Meeting, Seattle, WA.
- Rose, A.N.**, Bright, E.A., Fernandez, S.J., and Omitaomu, O.A. (2010). *Building a Synthetic Population to Support Social Simulation Environments*, Association of American Geographers Annual Meeting, Washington, D.C.

- Myers, A.T., Getman, D.J., **Rose, A.N.**, Sorokine, A. (2010). *Understanding Volunteered Geographic Information and Its Potential in Scientific Research*, Association of American Geographers Annual Meeting, Washington, D.C.
- Fernandez, S.J., **Rose, A.N.**, Bright, E.A., Omitaomu, O.A. (2009). *LandScan Data Sets for Automating Simulation Set-up while Accommodating Multiple Modeling Approaches within a Flexible Simulation Platform*, Human Behavior-Computational Intelligence Modeling Conference, Oak Ridge, TN.
- Bright, E.A., Bhaduri, B.L., Coleman, P.R., **Rose, A.N.** (2009). *Estimating Inter-Censal Population Growth and Population Dynamics using Disparate Data Sources*, Association of American Geographers Annual Meeting, Las Vegas, NV.
- Hecox, G.R., **Rose, A.N.** (2006). *Katrina Flood and Contamination Mapping: Using GIS to Rapidly Estimate Disaster Impact*, 26th Annual ESRI User Conference, San Diego, CA.
- Rose, A.N.**, Bond, J.A. (2006). *Help GIS Help You: Tips to Save Time and Money When Using GIS for Project Support*, Joint Services Environmental Management Conference, Denver, CO.
- Rose, A.N.** (2005). *Development of an Enterprise GIS File Management System*, 25th Annual ESRI User Conference, San Diego, CA.
- Rose, A.N.** (2005). *Aboard the Enterprise: How One DoD Installation is Taking on a New Mission for Their GIS Program*, Shaw Symposium, Orlando, FL.
- Rose, A.N.** (2003). *Developing a Nationwide Fixed-Guideway Transit Database*, Geographic Information Systems for Transportation Symposium, Colorado Springs, CO.
- Rose, A.N.** (2001). *Evaluation of ESRI's Transportation Data Model (UNETRANS) for use with USDOT Spatial Databases*, 21st Annual ESRI User Conference, San Diego, CA.

Reports

- Mays, G.T., Belles, R., Blevins, B.R., Hadley, S.W., Harrison, T.J., Jochem, W.C., Neish, B.S., Omitaomu, O.A., **Rose, A.N.** (2012). *Application of Spatial Data Modeling and Geographical Information Systems (GIS) for Identification of Potential Siting Options for Various Electrical Generation Sources*, ORNL/TM-2011/157, Oak Ridge National Laboratory, Oak Ridge, TN.
- Rose, A.N.**, Bhaduri, B.L., Bright, E.A., Graesser, J.B., Medina, R.M., Moehl, J.J., Santos-Hernandez, J.M., Urban, M.L., Vatsavai, R.R., and Weaver, J.E. (2011). *Regional Analysis and Characterization of Population Dynamics*, ORNL/TM-2011/266, Oak Ridge National Laboratory, Oak Ridge, TN.
- Tolliver, J.S., Lee, R.W., **Rose, A.N.**, Bright, E.A., and Nugent, P.J. (2011). *Analysis of Population Counting Methods*, ORNL/TM-2011/270, Oak Ridge National Laboratory, Oak Ridge, TN.
- Getman, D.J., Myers, A.T., **Rose, A.N.**, Sorokine, A., Nugent, P.J. (2009). *Architecture for Advancing Scientific Collaboration and Promoting Citizen Science*, Laboratory Directed Research and Development Report, Oak Ridge National Laboratory, Oak Ridge, TN.
- Rose, A.N.** (2005). *Enterprise GIS Implementation Plan, Redstone Arsenal*, Contract Report Prepared for the Department of the Army, Contract DACA21-96-D-0018, DO#21.
- Harrison, G., Dicer, G., Davis, F., Pillai, R., Liu, C., Sexton, A., Cooper, A., Hilliard, M., **Rose, A.N.**, Choi, B.-K., McGillivray, P., Noctor, A., Russell, R. (2001). *Improved Cargo Methods: Analysis of Defense Distribution Center (DDC) Supply Chain*, Contract Report Prepared for the Department of Defense, Defense Logistics Agency, Contract SP0410-99-D-0006; DO#3.

Patents

U.S. Patent: 14/163,372, "Locally Adaptive Spatially Explicit Population Projection System" (pending).

Copyrights

U.S. Copyright: LandScan 2014 (in progress), LandScan 2013, LandScan 2012, LandScan 2011, LandScan 2010, LandScan 2009, LandScan 2008, LandScan 2007.
 U.S. Copyright: LandCast 2030 (in progress), LandCast 2050 (in progress).

Professional Affiliations

Association of American Geographers
 Population Association of America

Professional Services

National Science Foundation (NSF) Small Project Proposal Review Panel: Information & Intelligent Systems (IIS) Division (2016)

Invited Peer Reviewer

International Journal of Geographical Information Science, PLOS One, Remote Sensing of Environment

Mentoring

UT-Battelle Staff

- Jake McKee (Jan 2012 – present), M.S., Geography, University of Southern Mississippi
- Eric Weber (Sept 2010 - present), M.A., Geography, University of Kansas

Research Associates

- Jason Wencak (Dec 2015 – present), M.A., Sociology, Bowling Green State University
- Gene Bailey (Oct 2015 – present), B.A., Geography, The University of Tennessee
- Susan Burtner (Sept 2015 – present), M.S., Urban Spatial Analytics, University of Pennsylvania
- Brian Moore (Nov 2013 - present), M.S., Geography, University of Southern Mississippi
- Melanie Phillips (Sept 2013 - present), M.S., Earth System Science, University of Alabama at Huntsville
- Dan Cobb (Oct 2012 – Oct 2013), M.S., Geographic Information Science, Northwest Missouri State University
- Hwahwan Kim (Aug 2009 – Sept 2011), Ph.D., Geography, University of Georgia

Student Interns

- John Duggan (Jan 2016 – present), Ph.D. Student, Computer Science, The University of Tennessee
- Hannah Gunderman (May 2015 – present), Ph.D. Student, Geography, The University of Tennessee
- Nathan Trombley (May 2015 – Aug 2015), M.S. Student, Geography, The University of Tennessee
- Joseph Roberts (May 2015 – August 2015; June 2013 – Aug 2013), M.S., Geography, The University of Tennessee
- Jessica Balkin (June 2014 – Aug 2014), Ph.D. Student, Anthropology, The University of Colorado at Boulder
- Thomas Balkcom (June 2014 – Aug 2014), B.S., Geography, Florida State University
- Helen Rosko (June 2013 – Aug 2013), M.S. Student, Political Science, College of Charleston
- Savannah Collins (June 2013 – Aug 2013), M.S. Student, Geography, The University of Tennessee
- Ephraim Love (June 2013 – August 2013), M.S. Student, Geography, The University of Tennessee
- Timmy Hyunh (June 2012 – July 2013), M.A., Social Sciences, University of Chicago
- Carlos Omar Rivera Pérez (June 2010 – Aug 2010), B.S. Student, Electrical Engineering, University of Puerto Rico at Mayagüez