

PROFILE

Social scientist developing and utilizing advanced quantitative methods to address topical social issues in health, housing, and transportation, with experience leading and working on interdisciplinary research projects.

EDUCATION

PhD, Geography University of Tennessee ◇ Chancellor Fellow	expected August 2018
MS, Applied Mathematics, Mathematical Ecology Specialization University of Tennessee	2013
BS, Applied Mathematics Valdosta State University	2010

PUBLICATIONS

- AUERBACH, J.**, AND E. FITZHUGH. (in preparation for the American Journal of Preventive Medicine). Small changes in street connectivity results in big gains for student walking.
- AUERBACH, J.**, C. BLACKBURN, H. BARTON, A. MENG, AND E. ZEGURA (in preparation for the Journal of the American Planning Association). Coupling data science with community crowdsourcing for urban revitalization policy analysis: An evaluation of Atlanta's Anti-Displacement Tax Fund.
- AUERBACH, J.**, AND H. KIM. (in review at Computers & Operations Research). Network connectivity optimization: An evaluation of heuristics applied to complex networks and a transportation case study.
- AUERBACH, J.**, AND H. KIM. (in review at Transportation Research: Part B). Hiking Eulerian Forests: Measuring robustness and coverage in multi-line networks.
- AUERBACH, J.**, H. BARTON, T. BLUNT, V. CHAGANTI, B. GHAI, A. MENG, C. BLACKBURN, E. ZEGURA, AND P. FLORES. 2017. Using data science as a community advocacy tool to promote equity in urban renewal programs: An analysis of Atlanta's Anti-Displacement Tax Fund. arXiv:1710.02454.
- GAVRILETS, S., **J. AUERBACH**, AND M. VAN VUGT. 2016. Convergence to consensus in heterogeneous groups and the emergence of informal leadership. *Scientific Reports*. doi: 10.1038/srep29704.
- AUERBACH, J.**, A. KANAREK, AND G.M. BURGHARDT. 2015. To play or not to play? That's a resource abundance question. *Adaptive Behavior*. 23(6): 354-361. doi: 1177/1059712315611188.
- GANUSOV, V.V., AND **J. AUERBACH**. 2014. Mathematical modeling reveals kinetics of lymphocyte recirculation in the whole organism. *PLOS Computational Biology*. 10(5). doi: 10.1371/journal.pcbi.1003586.
- KANG, J., AND **J. AUERBACH**. 2009. Thermodynamic characterization of dissociation rate variations of human leukocyte antigen and peptide complexes. *Molecular Immunology*. 46(15): 2873-2875. doi: 10.1016/j.molimm.2009.05.184.

PRESENTATIONS

- Using data science to promote equity (poster). 2018. American Planning Association National Planning Conference, New Orleans, LA.
- Street connectivity and student walking (poster). 2018. American Planning Association National Planning Conference, New Orleans, LA.
- Optimization of network connectivity: An evaluation of meta-heuristics and how small changes in street connectivity result in big gains for student walking (paper). 2018. The Association of American

Geographers, New Orleans, LA.

Coupling data science with participatory planning for equity in urban renewal programs: An analysis of Atlanta's Anti-Displacement Tax Fund (paper). 2018. GeoSym 2018, Knoxville, TN.

Coupling data science with participatory planning for equity in urban renewal programs: An analysis of Atlanta's Anti-Displacement Tax Fund (paper). 2017. University of Chicago Data Science for Social Good, Chicago, IL.

Using data science as a community advocacy tool to promote equity in urban renewal programs: An analysis of Atlanta's Anti-Displacement Tax Fund (paper). 2017. Bloomberg Data for Good Exchange, New York, NY.

A novel web-based scientific service to foster collaboration around data sets (invited talk). 2017. Georgia Institute of Technology, Atlanta, GA.

A new tool for geographic collaboration in a connected scientific world (paper). 2017. The Association of American Geographers, Boston, MA.

Geographic methods to analyze movement in networks (invited talk). 2016. United States Census Bureau, Population Division, Suitland, MD.

Time to consensus in heterogeneous groups and the benefits of leadership (paper). 2016. The Association of American Geographers, San Francisco, CA.

Wisdom and fairness: The emergence of leadership (poster). 2015. European Human Behaviour and Evolution Association, Helsinki, Finland.

Wisdom and fairness: The emergence of leadership (paper). 2014. Evolution, Raleigh, NC.

To play or not to play, that's a resource abundance question (poster). 2014. Evolution, Raleigh, NC.

Knowledge and fairness: Leadership through reputation (invited talk). 2014. United States Government Accountability Office, Advanced Research and Methods, Washington, DC.

The emergence of despotism or egalitarianism due to simple heuristics and variation in personality types (poster). 2013. Human Behavior and Evolution Society, Miami, FL.

Mathematical modeling reveals kinetics of lymphocyte recirculation between major murine organs (poster). 2012. University of Alabama School of Medicine, Birmingham, AL.

Aggressiveness and the evolution of hierarchies (paper). 2011. Southeastern Population Ecology and Evolutionary Genetics, Reidsville, NC.

EMPLOYMENT

Research Assistant 2017 - present

Center for Physical Activity and Health, University of Tennessee

- ◊ Developing optimization heuristics to create new thoroughfares that maximize student walking.
- ◊ Working with local planners to 'nudge' residential developers for more walkable communities.

Founder 2016 - present

MyDataLynx.org

- ◊ Created a web-based collaboration service for researchers and scientists.

Research Fellow 2016 - present

Population Division, U.S. Census Bureau

- ◊ Developing record linking algorithms to merge Big Data with granular Census data.
- ◊ Utilizing machine learning to measure migration propensities.

Data Scientist for Social Good 2017

Georgia Institute of Technology

- ◊ Led a team of interdisciplinary undergraduate and graduate student researchers for 10 weeks.
- ◊ Published a random forest model to forecast property values affected by an urban renewal project.
- ◊ Worked with residents to create an online tool to view the forecasts and update the data.

Geographic Science and Technology Intern 2015
 Computational Science and Engineering Division, Oak Ridge National Laboratory
 ◇ Conducted an analysis of geospatial change-detection methods and R algorithms.

Applied Research and Methods Analyst Intern 2014
 Center for Economics, U.S. Government Accountability Office
 ◇ Published an analysis of spatial models used for a government program.
 ◇ Published the impact of debt limit impasses with Google Trends data and Treasury Rates.

Research Assistant 2013 - 2014
 National Institute for Mathematical and Biological Synthesis
 ◇ Published a model to analyze decision-making and leadership emergence in social networks.

Combat Development NCO and Fireteam Leader 2001 - 2007
 820th Security Forces Group, United States Air Force
 ◇ Developed lesson plans and instructed trainers and operators in the use of new equipment.
 ◇ Supervised four soldiers conducting base defense operations in Iraq and Afghanistan.
 • Air Force Achievement Medal and Humanitarian Service Medal under Joint Task Force Katrina
 • Afghanistan Campaign Medal and twice the Iraq Campaign Medal
 • Military Outstanding Volunteer Service Medal for over 100 service hours with Habitat for Humanity

TECHNICAL SKILLS & SOFTWARE PROFICIENCIES

- ▷ Network Theory ▷ Statistics ▷ Geographic Information Science ▷ Stochastic Modeling
- ▷ Machine Learning ▷ Optimization ▷ Agent-based Simulations ▷ Evolutionary Algorithms

OS	Programming Languages & Software	
Linux	MATLAB	ArcGIS
Windows	R	CPLEX
MAC	Python	SQL

TEACHING EXPERIENCE

Teaching Associate 2011 - 2016
 Departments of Mathematics and Geography, University of Tennessee

Primary Instructor	Teaching Assistant
Math for Life Sciences I and II (MATH 151/152)	Quantitative Geography (GEOG 415)
Calculus I (MATH 141)	Geographic Information Science (GEOG 411)
Statistics (MATH 115)	Population Geography (GEOG344)

LEADERSHIP & PROFESSIONAL SERVICE

Reviewer, Journal of Theoretical Biology 2015 - present
Graduate Association of Research Geographers Officer, UTK 2015 - 2016
Geography Co-Representative, UTK Graduate Student Senate 2015 - 2016
Vice President and Graduate Student Senator, UTK Graduate Student Senate 2013 - 2016
Special Awards Judge, Southern Appalachian Science and Engineering Fair 2014
Graduate Student Mentor, UTK Department of Mathematics 2013 - 2014
Mathematics Representative, UTK Graduate Student Senate 2013 - 2014
Chapter Representative, AMS Valdosta State University Chapter 2009 - 2010

PROFESSIONAL MEMBERSHIP

Center for the Dynamics of Social Complexity, Member	2017
American Planning Association, Student Member	2017
Participatory Geographic Information Science Society, Member	2017
Association of American Geographers, Student Member	2015
- Spatial Analysis & Modeling specialty group, Student Member	
European Human Behaviour and Evolution Association, Student Member	2015
Human Behavior and Evolution Society, Student Member	2013
Society for Mathematical Biology, Student Member	2012
American Mathematical Society (AMS), Student Member	2009
Iraq Veterans Against the War, Member	2008

COMMUNITY SERVICE

Pet Foster , Adopt a Golden Knoxville	2017-present
Pet Foster , Young Williams Animal Shelter	2017-present
Statistical Analyst , Knoxville Habitat for Humanity	2017-present
Crew Leader and Construction Volunteer , Habitat for Humanity	2004-present
Volunteer , Back on My Feet Atlanta Chapter	2017
Volunteer , Autism Speaks Georgia Chapter	2016 - 2017
Head of Merchandise , UTK Darwin Day 2014	2013 - 2014
Media Volunteer , UTK Darwin Day 2013	2013
DJ , Hard Knox Roller Derby	2012 - 2013
Wikipedian	2012 - present

PROFESSIONAL DEVELOPMENT

Hierarchy and Leadership (3rd meeting) . Working Group. NimBIOS.	2014
Hierarchy and Leadership (2nd meeting) . Working Group. NimBIOS.	2013
Play, Evolution, and Sociality (3rd meeting) . Working Group. NimBIOS.	2013
Science Journalism: Curating the Universe . Master Class Conducted by Jeffrey Kluger, senior writer at Time Magazine, UTK	2013
Play, Evolution, and Sociality (2nd meeting) . Working Group. NimBIOS.	2012
Stochastics Applied to Biological Systems . Summer Graduate Workshop Mathematical Biosciences Institute, Ohio State University	2012
Modeling Social Complexity . Investigative Workshop. NimBIOS.	2012
STEM Biomathematics Summer Program . Florida State University.	2009
Non-commissioned Officer Training Airmen Leadership School, Moody Air Force Base ◇ Commandant Leadership Award	2005
USAF Special Operations School Middle East Orientation Course Moody Air Force Base	2005