JOSHUA J. VERTALKA, Ph.D

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EDUCATION

Doctor of Philosophy (Ph.D), Geography, Environment, and Spatial Sciences **2017**
Institution: Michigan State University, East Lansing, MI

Certificate of Global Urban Studies **2017**
Michigan State University, East Lansing, MI

Master of Urban and Regional Planning **2012**
Institution: Michigan State University, East Lansing, MI

Bachelor of Science, Geography: Urban and Regional Planning, GIS, Environmental Analysis **2009**
Institution: Western Michigan University, Kalamazoo, MI

NOTABLE ANALYTICAL METHODS

Spatial Regression (Autoregressive model, Simultaneous Error Model, Lagrange Multiplier)	Spatial Interpolation (IDW, B-Spline, Kringing)	Space-Time Analysis
Bayesian Spatial Interpolation	Spatial Point Pattern Analysis	Vector and Raster Modeling
Linear Regression	Artificial Neural Network	Data Visualization
Natural Language Processing	Dimension Reduction (PCA)	Random Forests
	Deep Learning Neural Networks	Spatial Autocorrelation
		Geocomputational Modeling

NOTABLE SOFTWARE SKILLS

R Program Language (4500+hours)	HTML, CSS, SPSS (200 hours)	QGIS SQL (100 hours)
ArcGIS and QGIS (4000+hours)	Tensorflow, H2O (200 hours)	Amazon Web Services (100 hours)
ggplot2 (250 hours)	Apache Spark (100 hours)	Python (100 hours)
Agent Based Modeling (250 hours)	Juypter Notebook (100 hours)	Docker Containers (60 hours)

RELEVANT PROFESSIONAL EXPERIENCE

Chief Data Scientist, RS21, Albuquerque, NM **2017 – 2020**

- Led data science efforts to find, build, and automate solutions that produced one of the world's most insightful and comprehensive social determinants of health production tools with over 2 billion unique insights derived from Bayesian spatial interpolation and spatial econometric approaches using opensource and purchased datasets.
- Led efforts to build site selection optimization products that used z-scoring, Monte Carlo simulations, spatial interpolation, and ranking algorithms.
- Increased government reporting performance by leading a team to create a vector based deep learning natural language processing system that produced a 40% improvement in how fast government agencies could build reports.
- Led data science, design, and project management teams through the data science process and best practices including: feature engineering, feature selection, model selection, model tuning, bias-variance tradeoff, in-balanced classes, and production code requirements for many of RS21's projects.
- Scaled data science at a quickly growing startup to include 6 data scientist that collaborate across development, design, marketing, and project management teams to produce high quality data science web-based applications, reports, blogs, and presentations, some including: natural language processing, MLA, CNN, and data mining.
- Led the standardization of data science processes including: data assessment, data dictionary, exploratory data analysis, Kanban tasking, and project execution.
- Helped craft organizational strategies and operations as part of the leadership team that led to unified front on company culture and data science directives.
- Coached and cultivated junior and senior data scientists and project managers on several professional development categories including: advanced analytical capabilities, application development, communication, and project execution which increased their trust in the company and their ability to execute projects better.
- Increased recruitment efforts by developing and enhancing recruitment pipelines with Universities and local bootcamps which led to consistent stream of data science applicants.

Geospatial Data Scientist/Curator, IDV Solutions, an Everbridge Company, Lansing, MI **2015 - 2017**

- Used Quantum GIS and R program language to inspect, clean, analyze, and visualize opensource geospatial data.
- Created, managed, and disseminated data to cross-functional teams that led to satisfied multi-billion-dollar clients.
- Created innovated spatial datasets through web scrapper applications, spatial analysis algorithms, and QGIS SQL database queries leading to novel datasets in products.
- Developed and maintained corporate metadata standards for creating, storing, and summarizing spatial datasets leading to better data documentation, communication, and ultimately management and governance.
- Prepared analytical reports and recommendations about spatial data to corporate leadership teams for stakeholders.

Research Assistant, Michigan State University, East Lansing, MI **2012 - 2017**

Dog Bite Hospitalizations in Detroit

- Led a multi-disciplinary research team that modeled spatial-temporal correlations of dog bite hospitalizations in Detroit, leading to data driven recommendations for authorities.
- Used a spectrum of data science approaches including: linear regression, logistic regression, random forests, and neural networks to understand and leverage a variety of data for scientific publications (see below publications).

1918-19 India Pandemic Spread

- Generated spatial and temporal analytical results, using geospatial modeling tools that produced raster and vector datasets to analyze the spread of the 1918-19 influenza pandemic.

Assessing Field Inspector Supervisor, City of East Lansing, East **2012 - 2016**
GIS/Watershed intern, Lake County Stormwater Management, Libertyville, IL **May 2008 - Sept 2008**
Resident Assistant, Western Michigan University, Kalamazoo, MI **Jan 2007 - April 2009**
Regional Manager, Student Painters Co., Manistee, MI **Sept 2006 - Sept 2007**

NOTABLE PUBLICATIONS

- Sidharth Chandra, E. Kassens-Noor, G. Kuljanin, and **Joshua J. Vertalka**. A Geographic Analysis of Population Density Thresholds in the Influenza Pandemic of 1918-19. International Journal of Health Geographies, 2013. 12:9.
- Grady, S. C., Frake, A. N., Zhang, Q., Bene, M., Jordan, D. R., **Joshua J. Vertalka**, … Pierre, L.-M. (2017). Neonatal mortality in East Africa and West Africa: a geographic analysis of district-level demographic and health survey data. *Geospatial Health*, *12*(1).
- **Joshua J. Vertalka,** Reese, L. A., Wilkins, M. J., & Pizarro, J. M. (2018). Environmental correlates of urban dog bites: A spatial analysis. *Journal of Urban Affairs*, *40*(3), 311–328.
- **Joshua J. Vertalka** (2018). The Augmentation, Potential, and Practicality of Twitter Data for Predicting Influenza Emergency Room Admissions. Michigan State University.
- Reese, L. A., **Joshua J. Vertalka**. J., Wilkins, M. J., & Pizarro, J. M. (2019). Demographic and urban environmental variables associated with dog bites in Detroit. *Journal of the American Veterinary Medical Association*, *254*(8), 986–990.
- Kassens-Noor, E., **Joshua J. Vertalka**, & Wilson, M. (2019). Good Games, bad host? Using big data to measure public attention and imagery of the Olympic Games. *Cities*, *90*, 229–236.
- **Joshua J. Vertalka**., Kassens-Noor, E., & Wilson, M. (2019). Data on sentiments and emotions of olympic-themed tweets. *Data in Brief*, *24*, 103869.
- **Joshua J. Vertalka**. (2019). Communicating Advanced Infrastructure Resiliency Analytics to Diverse Groups of Stakeholders. In *Frontiers of Engineering: Reports on Leading-Edge Engineering from the 2018 Symposium*. National Academies Press.

VOLUNTEER AND LEADERSHIP EXPERIENCE

Eagle Scout, Boy Scouts of America, Onekama, MI **2004-Present**
Scientific Reviewer, Spatial and Spatio-temporal Epidemiology Journal **2016-Present**
Volunteer, American Association of Geographers, Various Locations. **2015 - 2016**
President, Geography Graduate Group, Michigan State University, East Lansing, MI **2014 - 2015**
Organizer, Global Urban Studies Brown bag series, Michigan State University, East Lansing, MI **2014 - 2015**
Representative, Council of Graduate Students, Michigan State University, East Lansing, MI **2014 - 2015**