Shelby M. Scott

Statistician, Data Scientist, Quantitative Analyst

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Objective

Seeking a position to solve complex problems using quantitative methods to suggest evidence-based change. Over my 9 years of experience, I have applied my skill set to a variety of applications and sectors and would like to shift my current career focus from academic research and analysis to practical problem solving as part of a larger team.

Experience

Department of Defense - Army Research Office
Knoxville, TN

National Defense Science and Engineering Graduate Fellow
July 2017 - Present

- Carry out novel research at the doctoral level of military importance
- Remain in good standing as a fellow through coursework and research productivity

Program for Excellence and Equity in Research
Knoxville, TN

PEER Fellow
Aug. 2015 - Aug. 2017

- Show productive degree progress through coursework and research
- Attend weekly discourse meetings covering topics including professional development, grant writing, and other relevant information

Rhodes College Department of Mathematics
Memphis, TN

Departmental Assistant, Student Research Assistant, and Student Curriculum Advisor
Jan. 2012 - May 2015

- Produce appropriate citations, descriptions, and sources for datasets used in introductory statistics courses
- Give feedback on development of assignments and details of the curriculum for a discrete mathematical modeling course

Skills and Relevant Coursework

Skills

R, C++, Python, Mathematica, Matlab, Netlogo, LaTeX, SPSS, Stata, GitHub, ArcGIS

Relevant Coursework

Bayesian Modeling & Computations ● Advanced Epidemiology ● Probability & Mathematical Statistics ● Statistics for Research ● Nonlinear Optimization ● Scientific Computing for Biologists ● Statistics for Research I & II ● Mathematical Ecology I-IV

Talks and Presentations

Cellular Automata Modeling of Gun Crime in Chicago, IL

Handguns and Hotspots: Cellular Automata Models of Gun Crime in Chicago, various venues, 2016 - 2020 ● *Intelligent Intervention: Assessing Gun Violence Reduction Programs with Quantitative Methods*, College of Social Work Seminar, UTK. 2019

Agent-Based Modeling of the Santa Cruz Island Fox

An Agent-Based Model of Golden Eagle Predation on the Santa Cruz Island Fox, various venues, 2014 - 2016 ● *Genetic-Based Allee Effects in Island Foxes on Santa Cruz Island*, various venues, 2013 - 2014

Other Topics

Zombies, Foxes, and Murder: Experiences in Learning and Teaching Quantitative Biology Using Technology, Annual Meeting for the Society of Mathematical Biology, Sydney, NSW, Australia, 2018. ● *A Model of Multi-Drug Resistant Tuberculosis with Fast and Slow Latent States*, 2012 Symposium on Biomathematics and Ecology: Education and Research, St. Louis, MO, 2012.

Service

Mathematics of Gun Violence Workshop Co-Organizer

NIMBioS   *May 2019*

This Investigative Workshop incorporated discussions and critiques of the existing approaches to gun violence modeling and how these relate to the objectives for which models could be developed. The workshop included presentations from participants, a poster session to indicate the diversity of methods currently being used in the field, and breakout group discussions.

Communications Officer

SOCIETY OF MATHEMATICAL BIOLOGY (SMB): EDUCATION SUBGROUP   *July 2019 - Present*

My responsibilities include co-organizing activities and events of the subgroup, including informal virtual chats. I also run social media accounts for the subgroup and disseminate important resources and contribute to the SMB Newsletter to update the society on subgroup activities.

Co-Founder, President 2018 - 2019

ENGAGING KNOXVILLE IN ECOLOGY AND EVOLUTION (EKEE)   *August 2015 - Present*

The primary mission of EKEE is to educate and inspire the Knoxville community to preserve and conserve nature. As President, I created protocols for managing volunteer opportunities, led activities, and served as the main liaison.

Education

University of Tennessee, Knoxville   *Knoxville, TN*

PH.D. CANDIDATE IN ECOLOGY AND EVOLUTIONARY BIOLOGY, M.S. CANDIDATE IN STATISTICS   *Projected graduation: May 2021*

- **Dissertation Topic:** *Spatio-Temporal Modeling of Gun Crime in Chicago, Illinois*
- **Statistics Thesis Project:** *Analyzing Covariates of Diabetes Using Bayesian Linear Regression and Model Selection*
- **Advisor* and Committee Members:** Lou Gross*, Nina Fefferman, Sergey Gavrilets, Suzanne Lenhart
- **Areas of Study:** cellular automata, computational social science, spatio-temporal modeling, Bayesian statistics, data analytics

Rhodes College   *Memphis, TN*

BACHELOR OF SCIENCE IN BIOMATHEMATICS   *May 2015*

- **Senior Thesis:** *An Agent-Based Model of Golden Eagle Predation on the Santa Cruz Island Fox*
- **Advisor:** Erin Bodine
- **Areas of Study:** population dynamics, discrete and continuous mathematical modeling, agent-based modeling

Publications

Quantitative Criminology *(*publication in review)*

- **Scott, Shelby M.** & Gross, L.J.. COVID-19 and Crime: Analysis of Crime Dynamics Amidst Social Distancing Protocols. *PLOS One*.*
- **Scott, Shelby M.** & Gross, Louis J. The Mathematics Underlying Gun Violence. *SIAM News*, 2020.
- **Scott, Shelby**. A Report from the NIMBioS/DySoC Investigative Workshop on the Mathematics of Gun Violence. *SocArXiv*, 2020.

Agent-Based Modeling

- **Scott, Shelby M.**, Middleton, Casey E., & Bodine, Erin N. An Agent-Based Model of the Spatial Distribution & Density of the Santa Cruz Island Fox: The Effects of Golden Eagle Predation & Island Fox Recovery. *Integrative Population Biology and Modeling Part B*, 40: 3 - 32, 2019.
- **Scott, S.M.**, Yust, A. & Bodine, E.N. An Agent-Based Model of Santa Cruz Island Foxes (*Urocyon littoralis santacruzae*) which Exhibits an Allee Effect. *Letters in Biomathematics*, 2014; 1(1): 97 - 109.

Quantitative Biology Education

- Chen, Miranda M., **Scott, S.M.**, & Stevens, Jessica D. Technology as a tool in teaching quantitative biology at the secondary and undergraduate levels: a review. *Letters in Biomathematics*, 5(1): 30 - 48, 2017

Honors and Activities

Honors

Intermediate Spanish Award ● Meritorious Award - COMAP Mathematical Competition in Modeling ● Robert Allen Scott Award for Mathematics ● Jack U. Russell Award for Outstanding Senior Work in Mathematics ● Chancellor's Award ● Anne Mayhew Award

Activities

Technical Session Co-Organizer - Biomathematics and Ecology: Education and Research ● Graduate Student Affairs Committee Student Representative ● Graduates in Ecology, Behavior, and Evolution (GREBE) Secretary ● Crisis Text Line Volunteer