Ali Arab

Contact Information

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Academic Appointments

Georgetown University, Washington, DC

- Associate Professor of Statistics, August 2014-Present
- Assistant Professor of Statistics, August 2007-July 2014
- Department of Mathematics & Statistics
- Environmental Initiative
- Center for the Environment

Clemson University, Clemson, SC

- Adjunct Assistant Professor, January 2011-Present
- Department of Forestry & Natural Resources

Education

University of Missouri, Columbia, Missouri

- Ph.D., Statistics, August 2007
- Advisor: Christopher K. Wikle
- Dissertation Topic: "Hierarchical Bayesian Spatio-Temporal Models for Environmental Processes"

Southern Illinois University, Edwardsville, Illinois

- M.S., Mathematics and Statistics, May 2002
- Advisor: Steven E. Rigdon
- Thesis Topic: "Piecewise Exponential Model for the Reliability of k Repairable Systems"

Iran University of Science and Technology, Tehran, Iran

- B.S., Applied Mathematics and Operations Research, February, 1999

Honors and Awards

- National Science Foundation/American Statistical Association Conference Travel Award (August 2011), Awarded funds: $2,275.

- University of Missouri Outstanding Ph.D. Dissertation Award (April 2008)

- University of Missouri, Department of Statistics Katti Fund Graduate Student Travel Award (2005-2007; Awarded funds: $1,500)

- Southern Illinois University, College of Arts and Sciences Certificate of Honor (April 2002)

- Southern Illinois University Outstanding Achievement Recognition Program- Student Leadership (April 2002)

Publications

Peer-Reviewd Articles and Book Chapters

1. Arab, A., Jackson, M. and C. Kongoli (2014). Spatio-Temporal Analysis of Malaria Trends and Weather Effects in Western Africa. *Malaria Journal*.

2. Arab, A. and J. R. Courter (2014). Spatio-Temporal Trend Analysis of Historic Records of Spring Bird Arrival. *Communications in Statistics: Simulation and Computation*.

3. Arab, A. and G. Wimp (2013). Plant Production and Alternate Prey Channels Impact the Abundance of Top Predators. *Oecologia*, Volume 173, Issue 2, pages 331-341.

4. Zelt, J., Courter, J., Arab, A., Johnson R. and S. Droege (2012). Reviving a Legacy Citizen Science Project to Illuminate Shifting Migratory Bird Patterns. *The International Journal of Zoology*. Accepted (DOI:10.1155/2012/710710).

5. Arab A., Holan S., Wikle C. K. and M. L. Wildhaber (2012). Semiparametric Bivariate Zero-Inflated Poisson Models with Application to Studies of Abundance for Multiple Species. *Environmetrics*. Volume 23, Issue 2, pages 183-196.

6. Arab A., Rigdon S. E. and A. P. Basu (2012). Bayesian Inference for Piecewise Exponential Model for the Reliability of Multiple Repairable Systems. *Journal of Quality Technology*. Volume 44, Issue 1, pages 28-38.

7. Wildhaber M. L., Gladish D. and A. Arab (2012). Distribution and Habitat Use of the Missouri River and Lower Yellowstone River Benthic Fishes from 1996 To 1998: A Baseline for Fish Community Recovery. *River Research and Applications*. Volume 28, Issue 10, pages 1780-1803.

8. Witte C. C., Wildhaber M. L., Arab A. and D. B. Noltie (2009). Substrate Preference of Territorial Male Topeka Shiners (Notropis topeka) in the Absence of Sunfish (Lepomis sp.). *Ecology of Freshwater Fish*. Volume 18 Issue 3, pages 350-359.

9. Holan S., Wang S., Arab A., Sadler J. and K. Stone (2008). Semiparametric Geographically Weighted Response Curves with Application to Site-Specific Agriculture. *Journal of Agri-*

cultural, Biological, and Environmental Statistics. Volume 13, Issue 4, pages 424-439.

10. Arab A., Wildhaber M. L., Wikle C. K. and C. N. Gentry (2008). Zero-inflated Modeling of Fish Catch Per Unit Area Resulting from Multiple Gears: Application to Channel Catfish and Shovelnose Sturgeon in the Missouri River. *North American Journal of Fisheries Management.* Volume 28, Issue 4, pages 1044-1058.

11. Arab A., Hooten M. B. and C. K. Wikle (2008). Hierarchical Spatial Models. In *Encyclopedia of Geographical Information Science.* Editors: Shashi Shekhar and Hui Xiong. pages 425-431. Springer: New York.

External Grants

- U.S. Geological Survey: Statistical Modeling of the Missouri River Pallid Sturgeon Monitoring Program: A 3-year subaward to conduct statistical analysis of data obtained from monitoring programs of Pallid Sturgeon in the Missouri River with possibility of renewal of the subaward contingent on funds availability (Summer 2012- Summer 2014). Awarded funds: $58,256.

- DC Water Resources Research Institute (DCWRRI) Seed Grant (January 2011), PI: Arash Massoudieh, Co-PI: Tolessa Dekisissa, UDC, Ali Arab (Collaborator), Awarded funds: $14,983.

- DC Water Resources Research Institute (DCWRRI) Seed Grant (January 2010), PI: Ali Arab, Co-PI: Tolessa Dekisissa, UDC, Awarded funds: $14,996.

- U.S. Geological Survey: Statistical Modeling of Benthic Fish Species Abundance Data: A 3-year subaward for statistical analysis of data on endangered and imperiled species of fish in the Missouri River (Summer 2008- Summer 2010). Awarded funds: $49,023.

Internal Grants & Fellowships

- Georgetown University, Medical Center, Department of Biostatistics, Bioinformatics, and Biomathematics: Flexible Statistical Models for the Analysis of Zero-Inflated Biological Data (February 2012, PIs: George Luta and Ali Arab), Awarded funds: $3,200 (summer support for 12 weeks, 20 hours per week for a graduate student researcher).

- Georgetown University Environmental Initiative: Partnership with USGS/NABPP (February 2012, PI: Ali Arab). Awarded funds: $18,000.

- Georgetown University Environmental Initiative: Bivariate Ecological Community Model (February 2012, PIs: Gina Wimp and Ali Arab). Awarded funds: $11,000.

- Georgetown University Junior Faculty Research Fellowship (Spring 2011): Fellowship provided release from teaching and service for one semester at full pay.

- Georgetown University Spring 2011 Grant-in-Aid Program (March 2011, PI: Ali Arab), Awarded funds: $1,250.

- Georgetown University Research Infrastructure Grant (2009): Advanced Computing Infrastructure (Co-PIs: Kim Sellers and Mahlet Tadesse), Awarded funds: $25,000.

- Georgetown University Summer Research Grant: a competitive research grant awarded by the Graduate School (Summer 2008), Awarded funds: $9,500.

Conference & Seminar Presentations

Presentations at International Conferences

- European Meeting of Statisticians (EMS 2013), Budapest, Hungary, July 2013 (*Invited Speaker*)
- Joint Meeting of International Young Business and Industrial Statisticians & Young Portuguese Statisticians (yBIS/jSPE 2012): Lisbon, Portugal; July 2012.
- The 58th World Statistics Congress, the International Statistical Institute (ISI 0211): Dublin, Ireland; August 2011.

Invited Presentations

- Joint Statistical Meetings (JSM 2014): Boston, MA; August 2014
- Millersville University, Department of Earth Sciences, March 13, 2014
- University of Missouri, Department of Statistics, September 2013. *Frontiers in Methodological and Applied Statistics: A Celebration of 50 Years*, Columbia, MO, 19-21 September 2013
- Joint Statistical Meetings (JSM 2013): Montreal, Canada; August 2013
- Medstar Health Research Institute, Hyattsville, MD, March 2013
- Colorado State University, Department of Statistics, November 2012
- Clemson University, Department Forestry and Natural Resources, March 2012
- Joint Statistical Meetings (JSM 2011): Miami, FL; August 2011
- Virginia Tech University, Department of Computer Science, April 2011
- American University, Department of Mathematics and Statistics, March 2011
- Joint Statistical Meetings (JSM 2009): Washington, DC; August 2009
- National Institute of Standards and Technology (NIST), Statistical Engineering Division, Gaithersburg, MD, June 2009
- Joint Statistical Meetings (JSM 2008): Denver, CO; August 2008 (*Invited Poster*)
- University of Maryland- Baltimore County, Department of Mathematics and Statistics, November 2008
- University of Maryland-College Park, Department of Mathematics and Statistics, October 2008
- George Washington University, Department of Statistics, September 2008
- American Fisheries Society 137th Annual Meeting, San Francisco, California; September 2007
- Virginia Commonwealth University, Department of Statistical Sciences and Operations Research, Richmond, Virginia, February 2007
- RAND Corporation, Statistics Group, Santa Monica, California, February 2007
- Georgetown University, Department of Mathematics, Washington, D.C., February 2007

Contributed Presentations

- ISBA- George Box Research Workshop at George Washington University; May 2014 (*poster*)
- Georgetown University Medical Center, The 2nd Annual Biomedical Informatics Symposium; October 2013 (*poster*)
- Joint Statistical Meetings (JSM 2012): San Diego, CA; August 2012
- Joint Statistical Meetings (JSM 2010): Vancouver, Canada; August 2010

- The 8th Annual Hawaii International Conference on Statistics, Mathematics and Related Fields: Honolulu, HI; January 2009 (*poster*)
- Joint Statistical Meetings (JSM 2007): Salt Lake City, Utah; 2007
- 32nd Spring Lecture Series, University of Arkansas, Spatial and Spatio-Temporal Statistics; April 2007
- 67th Annual Midwest Fish and Wildlife Conference, Omaha, Nebraska; December 2006
- Joint Statistical Meetings (JSM 2006): Seattle, WA; August 2006
- Joint Statistical Meetings (JSM 2005): Minneapolis, MN; August 2005
- International Biometric Society ENAR: Austin, TX; March 2005
- ASA Environmetrics Conference, Chicago, IL; October 2004

Workshops Attended

- AAAS Program Evaluation Workshop (June, 2013)
- Georgetown University, Teaching, Learning, and Innovation Summer Institute (TLISI) Workshops (2008-2012)
- AAAS Science & Human Rights Coalition Meeting, Washington, DC (2011-2013)
- Info-Metrics Institute, American University, Information and Econometrics of Networks, Washington, DC(March 2012)
- Georgetown University, Faculty Workshop on the Environmental Project Invited by President DeGioia (January 2010)
- Georgetown University, Initiating and Conducting Externally Sponsored Research (January 2010)
- Georgetown University, Environmental Studies Meeting with President DeGioia (July 2009)
- Georgetown University, Effective Classroom Interaction Faculty Workshop (November 2008)
- Georgetown University New Faculty Orientation (Fall 2007)
- SAMSI, Workshop on the NSF program Cyber-enabled and Discovery Initiative, SAMSI, Research Triangle, NC (Fall 2007)
- MD/DC/VA Section NExT workshops (Fall 2007, Spring 2008, Fall 2008)
- National Center for Atmospheric Research (NCAR), Fusing Geophysical Models with Data, Boulder, CO (June 2005)
- National Center for Atmospheric Research (NCAR), Spatio-Temporal Modeling Workshop, Boulder, CO (June 2003)
- University of Missouri, Program for Excellence in Teaching, Columbia, MO (August 2002)

Teaching Experience

Georgetown University

- **MATH-006 Statistics with Exploratory Data Analysis** (Fall 2008; Summer 2009-2010; Spring 2013)

- **MATH-140 Introduction to Mathematical Statistics** (Spring 2009)

- **MATH-234 Mathematical Statistics II** (Spring 2008)–No longer offered.

- **MATH-240 Applied Statistical Methods I** (Spring 2009; Fall 2009-2012)

- **MATH-405 Applied Time Series Analysis** (Spring 2013, Fall 2013)

- **MATH-503 Mathematical Statistics** (Spring 2010, 2012, 2014)

- **MATH-651 Regression Methods/Generalized Linear Models** (Fall 2007-2014)

- **MATH-701 Statistical Consulting Practicum** (Spring 2008)–No longer offered.

- **MATH-301/302 Tutorial (independent study)** (Spring 2008; Fall 2012-2014)

- **MATH-703 Internship** (Spring 2008)

Other Institutions

University of Missouri
- Introduction to Statistics and Probability: Instructor (Fall 2005 - Spring 2006)
- Statistical Reasoning: Recitation Instructor (Fall 2002)

Southern Illinois University-Edwardsville
- College Algebra: Instructor (Spring 2002)
- Introduction to Statistics and Probability: Teaching Assistant (Summer 2000)
- Multivariable Calculus: Teaching Assistant (Spring 2000 and Fall 2001)

Research Mentoring

Doctoral Students

- **Jason Courter (Ph.D. Wildlife and Conservation Ecology, Clemson University-Graduated July 2012):** I worked with Jason on his Ph.D. dissertation on spring arrival of birds in North America and provided help on statistical modeling. Jason is currently a visiting faculty at Taylor University and we are collaborating on projects related to the NABPP data.

- **Ying Zhang (Ph.D. Candidate, Global Health, Georgetown University–Graduated in May 2013):** I co-advised Ying's dissertation work jointly with Professor Mike Stoto from the School of Nursing and Health Studies of Georgetown University. Ying's doctoral research included developing hierarchical Bayesian models to characterize influenza epidemics based on multiple data streams from Hong Kong.

Undergraduate & Masters Students

- **Christianne (Christie) Greer (M.S. Applied Mathematics and Statistics–Graduated December 2011):** Christie worked with me during Spring, Summer and Fall 2011 on a funded research project to analyze monthly precipitation data for the DC area. She is currently working as a statistical analyst at a consulting firm in Washington, DC. Christie presented the results of her research to a panel at the University of the District of Columbia in 2011.

- **Julie Menken (B.S. Mathematics, Graduated May 2012):** Julie worked with me during Spring 2011 on data analysis for a funded research project to analyze monthly precipitation data for the DC area.

- **Ben Feng (B.S. Mathematics, Graduated May 2012):** Ben worked with me during Spring 2012 on statistical analysis for Ultimate Frisbee. We have submitted an article on this

project to *CHANCE* which is currently under review. Ben is currently teaching high school mathematics.

- **Joshua Chang (M.S. Applied Mathematics and Statistics, Graduated May 2012):** Josh worked with me during Fall 2011 on data visualization for spring arrival records from the NABPP database. Josh wrote Python scripts for efficient mapping of these data. Currently, Josh is working as a data analyst in a consulting firm in the DC area.

- **Xiaojing (Erin) Hu (M.S. Applied Mathematics and Statistics, Expected May 2013):** Erin has been working with me on a hierarchical Bayesian model for fisheries data since Spring 2012.

- **Yayun Xie (M.S. Applied Mathematics and Statistics, May 2013):** Yayun has been working on a funded research project on hierarchical models for ecological community data since July 2012. Currently, Yayun works as a full-time data analyst at a DC based company, SATMAP.

- **Xi Cheng (M.S. Applied Mathematics and Statistics, May 2013):** Xi has been working on a funded research project on hierarchical models for ecological community data since July 2012. Currently, Xi works as a full-time data analyst at a DC based company, SATMAP.

- **Yun Ling (B.S. Mathematics–May 2013):** Yun is currently working on her Honors Thesis under my guidance. She is working on statistical modeling of a game theory problem based on the "hot hand effect" in tennis using a large data set of 60,000 observations from several recent tournaments.

- **Danielle Swanson (B.S. Mathematics–Expected May 2015):** Danielle works with me on two different projects since May 2013. One of the projects involves statistical modeling of historic spring arrival data. This project is a partnership program between Georgetown University, the North American Bird Phenology Program, and the U.S. Geological Survey. The second project is part of the collaboration with the AAAS Human Rights Coalition, in particular, the Service to the Human Rights Community which involves developing an indicator for science human rights for different countries based on statistical data.

- **Alex Luta (B.S. Government–Expected May 2016):** Alex works with me on quantitative analysis of human rights related data. In particular, Alex works on using geospatial technologies for human rights projects.

- **Nazanin Dameshghi (M.S. Mathematics and Statistics-Expected May 2014):** Nazanin is a graduate student in statistics at American University. Nazanin is working on hierarchical spatial models for ecological count data with application to fisheries data.

- **Mingye May Cai (B.S. Statistics):** Mingye May worked with me during Summer 2013 on Bayesian and classical estimation for modeling precipitation time series data for the DC area. Mingye May is currently an undergraduate in statistics at University of California-Davis.

Academic Advising & Mentoring

Undergraduate

- Jonathan Balloch (Graduated May 2011)
- Jamara Clark (Graduated May 2012)
- Andrew Herren (Graduated May 2012)
- Alexander Clark (Graduated May 2012)
- Connor Brogan (In Progress)
- Drew Renzi (In Progress)
- Hamza Husain (In Progress)

Graduate (Masters)

- Erin Vickery (Graduated May 2011)
- John Matson (Graduated May 2011)
- Christianne Greer (Graduated December 2011)
- Jacob Enriquez (In Progress)
- Lauren Smith (In Progress)

Consulting & Professional Experience

- Consultant (*Pro Bono*): Casey Trees (DC based non-profit organization Urban)
- Consultant: Deartment of Transplant Surgery, Georgetown University Hospital (2009-Present)
- Consultant (*Pro Bono*): U.S. Geological Survey, Beltsville, MD (2010 -2012)
- Consultant: U.S. Geological Survey, Columbia, MO (May 2005 -Present)
- Research Assistant: U.S. Geological Survey, Columbia, MO (May 2005 -July 2007)
- Actuarial Science Intern (paid position): Buck Consultants (May 2001 -August 2002)

Professional Service

Department of Mathematics & Statistics

- Departmental Self-Study (Fall 2012)
- Merit Review Committee (Fall 2012-Spring 2013)
- Graduate Admission Committee (Fall 2009-Spring 2010-Fall 2010)
- Graduate Steering Committee (Spring 2012)
- Curriculum Committee (Fall 2007 -Fall 2011)
- Library Committee (Fall 2007-Spring 2010; Fall 2011-Present)
- Statistics Sub-Committee (Fall 2007 -Present)
- Teaching Merit Review Committee (Spring 2009-Fall 2009)

Georgetown University

- Georgetown College Goldwater Fellowship Committee (Fall 2007)
- Center for the Environment (Fall 2007-Present)
- Executive Faculty Committee (Spring 2009)
- Faculty Meeting on Environmental Research, Invited by President DeGioia (July 2009)
- Advanced Research Computing (Fall 2011-Present)
- G-QUADS (Georgetown Quantitative Analysis and Data Science) (Spring 2013)

National Service

- Expert Witness for the United States Government, Department of Justice (April 2012-Present)
- Representative of the American Statistical Association (ASA) to the AAAS Science and Human Rights Coalition (May 15, 2014-Present)
- Organizer and host of a discussion panel on "Repression of Students and Academics in Iran" at Georgetown University (November 16, 2013) jointly with Amnesty International and the Committee of Concerned Scientists; The event highlights the case of Omid Kokabee, a nuclear physicist imprisoned by the Iranian regime due to his refusal to participate in the regime's nuclear program.

Organizer and Chair of Conference Sessions

- Contributed Session Chair: "Space-Time Modeling II" (JSM 2012, San Diego, CA)
- Contributed Session Chair: "Methods for Ecological Data" (JSM 2011, Miami Beach, FL)
- Invited Session Chair: "New Developments for the Analysis of Spatial and Temporal Systems in Ecology" (JSM 2009, Washington, DC)
- Invited Session Organizer: "Model Specification and Uncertainty in Ecological Analyses" (ENAR 09, March 15-18, 2009, San Antonio, TX)

Other

- ASA's Transportation Statistics Interest Group-Member (2011-Present)
- ASA's Section on Statistics & the Environment (ENVR)-Member (2006-Present)
- ASA's Committee on Scientific Freedom and Human Rights- Friend (2012-Present)
- AAAS Science and Human Rights Coalition Membership & Outreach Committee-Member (2012-Present)
- AAAS Science and Human Rights Coalition Membership & Outreach Committee-Co-Chair (2013-Present)
- AAAS Science and Human Rights Coalition Service to the Human Rights Community Committee-Member (2011-Present)
- *Pro-Bono* statistical consulting for Casey Trees, and the USGS (October 2010-Present)
- Undergraduate Studies Committee, University of Missouri, Statistics Department (2004 -2007)
- Website Committee, University of Missouri, Statistics Department (2004 -2005)

Professional Organizations & Associations

- American Association for the Advancement of Science (AAAS) Science and Human Rights Coalition (2011-Present)
- Washington D.C. ASA Chapter- Washington Statistical Society (Since 2008)
- American Statistical Association Section on Environment (ENVR), member (Since 2006)
- American Statistical Association, member (Since 2003)
- Institute of Mathematical Statistics, member (Since 2004)
- University of Missouri, Statistics Graduate Students Association (SGSA), member (2002 -2007)
- University of Missouri, Statistics Graduate Students Association, Secretary (2003 -2004)
- American Mathematical Society, member (2000-2002)

Referee/Editor Experience

- Environmental and Ecological Statistics (EES)
- Environmetrics

- Ecological Applications (Subject-Matter Editor)
- Ecological Modelling
- Ecological Monographs
- Journal of Animal Ecology
- Stochastic Environmental Research & Risk Assessment (SERRA)
- Geoderma
- Biological Conservation
- IEEE Transactions on Reliability
- Journal of the American Statistical Association (JASA)-Applications and Case Studies
- Journal of Agricultural, Biological, and Environmental Statistics (JABES)
- Proceedings of the Royal Society-Proceedings A
- Served as reviewer for the Internal Review process required by the USGS (one research paper, and two abstracts)
- WIREs Computational Statistics
- The 32nd Int'l Conference on Information Technology Interfaces (Reviewer; June 2010, Croatia)
- College Mathematics Journal
- Springer (Book chapter review)
- Pearson Education (Textbook review: Statistics)
- Pearson Education (Textbook review: Stats, Data and Models)
- Chapman & Hall/CRC (Book proposal review)
- W.H. Freeman (Textbook review: Introduction to the Practice of Statistics)

In the News

- "Has a New Era of Academic Warfare Arrived?" by Ali Arab and Jeffery Toney. *Huffington Post*, June 12, 2013. The article discusses the impacts of academic sanctions and boycotts. In particular, the authors examine the adverse effects of boycotts of Israeli scientists and scholars, as well as the indirect impacts of sanctions on Iranian scholars and students. The authors discuss the academic boycotts and sanctions in light of the principles of science and human rights as described in the Article 15 of the International Covenant on Economic, Social and Cultural Rights (ICESCR).
- Report on ASA-AAAS focus group on human rights and statistics. *Amstat News*, November 2012 issue. To Appear.
- "Are U.S. Iranian Sanctions Self-Defeating?" by Natasha Bahrami, Ali Arab, and Jeffery Toney. *Huffington Post*, July 26, 2012. The article discusses the negative by-products of the economic sanctions of Iran on information exchange and scientific activities.
- Interviewed by the Associated Press on the probabilities related to winning the MegaMillion lottery; Broadcasted by the National Public Radio (NPR). March 30, 2012.
- Featured in "Meet ENVR Members" American Statistical Association's Section on Statistics & the Environment (ENVR) Newsletter, Summer 2012.
- Research profile featured in "Modeling the Environment" *Georgetown College Newsletter*, March 1, 2012.

Computer Skills

- Statistical softwares and programming: MATLAB, R/S-plus, WinBUGS & OpenBUGS, SAS, Stata, Minitab, FORTRAN, C++.
- Platforms: Unix/Linux, Mac OS and Windows.