MICHAEL D. PORTER

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EMPLOYMENT

2018–	**University of Virginia**, Associate Professor *Engineering Systems and Environment* *School of Data Science*
2018–2019	**University of Virginia**, Associate Professor *Darden School of Business*
2013–2018	**University of Alabama**, Assistant/Associate Professor *Information Systems, Statistics, Management Science*
2008–2013	**Spadac/GeoEye/DigitalGlobe**, Principal Research Scientist
2007–2008	**Statistical and Applied Mathematical Sciences Institute (SAMSI)**, Post-doc
2006–2008	**North Carolina State University**, VIGRE Postdoc Fellow *Department of Statistics*
1998–2001	**Sanford/Newell-Rubbermaid**, Project Engineer

EDUCATION

2006	Ph.D.	**University of Virginia**	Systems and Information Engineering
2003	M.S.	**Vanderbilt University**	Systems Engineering/Management of Technology
1998	B.S.	**Purdue University**	Industrial Engineering

PUBLICATIONS

1. Mohler, G. et al. "Learning to rank spatio-temporal event hotspots". In: *Crime Science* 9.3 (2020), pp. 1–12
2. Cheng, F., Porter, M. D., and Colosi, L. M. "Is hydrothermal treatment coupled with carbon capture and storage an energy-producing negative emissions technology?" In: *Energy Conversion and Management* 203 (2020), p. 112252
3. Porter, M. D. and Akakpo, A. "Detecting, identifying, and localizing radiological material in urban environments using scan statistics". In: *2019 IEEE International Symposium on Technologies for Homeland Security (HST)*. IEEE. 2019, pp. 1–6. eprint: https://arxiv.org/abs/2002.03224
4. Abrisqueta, A. et al. "Evaluation of VDOT's Safety Service Patrols to Improve Response to Incidents". In: *2019 Systems and Information Engineering Design Symposium (SIEDS)*. IEEE. 2019, pp. 1–5
5. Mohler, G. and Porter, M. "Rotational grid, PAI-maximizing crime forecasts". In: *Statistical Analysis and Data Mining* 11.5 (2018), pp. 227–236
6. Wang, K. and Porter, M. "Optimal Bayesian Clustering using Non-negative Matrix Factorization". In: *Computational Statistics and Data Analysis* 128 (2018), pp. 395–411
7. Wang, K. et al. "How the Choice of Safety Performance Function Affects the Identification of Important Crash Prediction Variables". In: *Accident Analysis and Prevention* 88.1 (2016), pp. 1–8

8. Porter, M. "A Statistical Approach to Crime Linkage". In: *The American Statistician* 70.2 (2016), pp. 152–165

9. Bouhana, N., Johnson, S. D., and Porter, M. D. "Consistency and specificity in burglars who commit prolific residential burglary: Testing the core assumptions underpinning behavioural crime linkage". In: *Legal and Criminological Psychology* 21.1 (2016), pp. 77–94

10. Reich, B. and Porter, M. "Partially-supervised spatiotemporal clustering for burglary crime series identification". In: *Journal of the Royal Statistical Society: Series A (Statistics in Society)* 178.2 (2015), pp. 465–780

11. White, G. and Porter, M. "GPU accelerated MCMC for modeling terrorist activity". In: *Computational Statistics and Data Analysis* 71 (2014), pp. 643–651

12. White, G. et al. "Modelling the effectiveness of counter-terrorism interventions". In: *Trends and Issues in Crime and Criminal Justice* 457 (2014), pp. 1–8

13. White, G., Porter, M., and Mazerolle, L. "Terrorism Risk, Resilience, and Volatility: A Comparison of Terrorism in Three Southeast Asian Countries". In: *Journal of Quantitative Criminology* 29.2 (2013), pp. 295–320

14. Reich, B. J. and Porter, M. D. "Discussion of Estimating the historical and future probabilities of large terrorist events". In: *The Annals of Applied Statistics* 7.4 (2013), pp. 1871–1875

15. Porter, M. and White, G. "Self-exciting hurdle models for terrorist activity". In: *The Annals of Applied Statistics* 6.1 (2012), pp. 106–124

16. Porter, M. D. and Reich, B. J. "Evaluating temporally weighted kernel density methods for predicting the next event location in a series". In: *Annals of GIS* 18.3 (2012), pp. 225–240

17. Porter, M. D., White, G., and Mazerolle, L. "Evidence-Based Counterterrorism Policy". In: *Evidence-Based Counterterrorism Policy*. Ed. by Lum, C. and Kennedy, L. W. Springer New York, 2012. Chap. Innovative Methods for Terrorism and Counterterrorism Data, pp. 91–112

18. Porter, M. and Smith, R. "Network Neighborhood Analysis". In: *IEEE Int. Conf. on Intelligence and Security Informatics (ISI)*. Vancouver, B.C., 2010, pp. 31–36

19. Neimi, J., Porter, M., and Reich, B. "Mixture Likelihood Ratio Scan Statistic for Disease Surveillance". In: *Advances in Disease Surveillance* 5 (2008), p. 1

20. Porter, M. D. and Brown, D. E. "Detecting local regions of change in high-dimensional criminal or terrorist point processes". In: *Computational Statistics & Data Analysis* 51.5 (2007), pp. 2753–2768

In Progress

21. White, G., Ruggeri, F., and Porter, M. "Endogenous and Exogenous Effects in Contagion and Diffusion Models of Terrorist Activity"

22. Li, H. and Porter, M. D. "A Fast Two Stage Anomaly Detection Method for Large Dynamic Networks"

23. Liao, Y. and Porter, M. D. "The Predictability of Highway Crash Hotspots"

24. Posey, C. et al. "Predictive Based Model Selection for Detecting Insider Cyber Security Threats"

25. White, G. and Porter, M. "Contagion and Diffusion Models for the Dynamics of Terrorist Activity". Under Contract with CRC Press

Other

2019	Porter, M.D. and Wang, K. (2019) "Bayesian Clustering using Non-negative Matrix Factorization", Proceedings of the 12th Scientific Meeting of the Classification and Data Analysis Group (CLADAG).
2017	Porter, M.D. (2017) "Multivariate Hawkes Point Process Models for Social Systems", Proceedings of the 62nd World Statistics Congress of the International Statistical Institute.
2016	Porter, M.D., Das T., and Zhang, R. (2016) Predictive Crash Analytics, Technical Report, CAPS (Center for Advanced Public Safety), University of Virginia.
2015	Porter, M.D. and Reich, B.J. (2015) crimelinkage: Statistical Methods for Crime Series Linkage, CRAN. (Open source software and user manual).
2014	Porter, M.D. and Reich, B.J. (2014) "Statistical Methods for Crime Series Linkage". The National Institute of Justice Technical Report.
2011	White, G., Porter, M.D. and Mazerolle, L. (2011). The Volatility and Risk of Terrorist Incidents: A Comparative Study Using Self-Exciting Models. Chapter 5 In *Modeling the Effectiveness of Counter-Terrorism Strategies in Indonesia, the Philippines, and Thailand*. A START/CEPS research report.
	White, G., Mazerolle, L., and Porter, M.D. (2011). Modeling Counter-Terrorism Interventions and their Relative Effectiveness. Chapter 7 In *Modeling the Effectiveness of Counter-Terrorism Strategies in Indonesia, the Philippines, and Thailand*. A START/CEPS research report.
	Porter, M.D. and Holland, B. (2011). Discovering Temporal Association between Two Types of Events. GeoEye Analytics Technical White Paper.
2010	Porter, M.D. (2010). Multivariate Change Detection. GeoEye Analytics Technical White Paper.
2009	Ghosh, S.K. and Porter, M.D. (2009). Spatio-Temporal Modeling of Health Related Incidents. Report to Centers for Disease Control and Prevention (CDC).
	Dalton, J.R. and Porter, M.D. (2009). Geospatial Preference Models in Signature Analyst. SPADAC Technical White Paper.
	Porter, M.D. (2009). Modeling Site Selection Behavior: Applications to Crime and Terrorism. In JSM Proceedings. Alexandria, VA: American Statistical Association, 5284-5293.
2007	Porter, M.D. (2007). Probability Estimates for Footwear Evidence.
2006	Porter, M.D. (2006). Detecting Space-Time Anomalies in Point Process Models of Intelligent Site Selection. Doctoral Dissertation, University of Virginia. Dissertations & Theses University of Virginia database. (Publication No. AAT 3225959).

FUNDING

SOFTWARE :octocat:

R | `crimelinkage`: a set of tools to help crime analysts and researchers with tasks related to crime linkage. This package includes methods for criminal case linkage, crime series identification and clustering, and suspect identification.

CONFERENCE PRESENTATIONS

2019 | "Detecting, identifying, and localizing radiological material in urban environments using scan statistics". 2019 IEEE International Symposium on Technologies for Homeland Security, Nov 5 Nov 6, Woburn, MA.

"Bayesian Clustering using Non-negative Matrix Factorization". 12th Scientific Meeting of the Classification and Data Analysis Group (CLADAG), Sep 11 Sep 13, Cassino, Italy.

"Spatial event hotspot prediction using multivariate Hawkes features". Spatial Statistics 2019, Jul 10 Jul 13, Sitges, Spain.

"Exciting Adventures in Crime Linkage". Mathematical Criminology and Security Workshop, Mar 17 Mar 22, BIRS Banff, AB.

2018 | "Predicting crime hotspots using rotational grids and sparse logistic regression models". Joint Statistical Meetings, Jul 28 Aug 2, Vancouver, BC.

2017 | "Understanding and Evaluating Predictive Crash Models". SAMSI Summer Program on Transportation Statistics, Aug 14-18, Duke University.

"Point Process Models for Social Systems". ISI World Statistics Congresses, Jul 16-21, Marrakesh, Morocco.

2016 | "Crime Linkage with Self-Exciting Point Process Models". Joint Statistical Meetings, Jul 30 Aug 4, Chicago, IL.

2015 | "Statistical Methods for Crime Series Linkage". International Association of Crime Analysts Training Conference (IACA), Sept 20-25, Denver, CO.

"A Statistical Approach to Crime Linkage". Joint Statistical Meetings, Aug 8 - 13, Seattle, WA.
 Media Coverage: (i) http://www.forensicmag.com/news/2015/08/not-just-hunch-new-software-uses-stats-solve-predict-burglary-experts-say (ii) Software identifies missing link, Police Professional, (20 Jan 2016)

2014 | "Interval-Censoring Methods for Aoristic Crime Analysis". Joint Statistical Meetings, Aug 2- 7, Boston, MA.

2013 | "An Interval Censoring Approach for Aoristic Analysis". American Society of Criminology Annual Meeting (ASC) Nov 19-23, Atlanta, GA.

"Statistical Crime Linkage: Case Linkage, Crime Series Identification, and Clustering". International Association of Crime Analysts Training Conference (IACA), Sept 9-13, Fort Lauderdale, FL.

"Discussion of Clauset and Woodard: Estimating the Historical and Future Probabilities of Large Terrorist Events". Joint Statistical Meetings, Aug 3- 8, Montreal, Canada. (Invited Discussant for "Annals of Applied Statistics" session.)

2012 | "Identifying suspects, discovering new offenders and linking crimes: Crime series identification using model-based clustering". American Society of Criminology Annual Meeting (ASC) Nov 14-17, Chicago, IL.

"Self-Exciting Hurdle Models for Terrorist Activity". Joint Statistical Meetings, Jul 28-Aug 2, San Diego, CA. (Invited "Best of the Annals of Applied Statistics" session.)

"Weighted Kernel Density for Predicting the Location of the Next Event in a Series". Quantitative Methods in Defense and National Security (QMDNS), May 1, George Mason University

2011 | "Bayesian Crime Series Linkage Analysis". American Society of Criminology Annual Meeting (ASC) Nov 16-19, Washington, D.C.

“Bayesian Crime Series Linkage Analysis". NIJ Crime Mapping Conference (MAPS), Oct 19-21, Miami, FL.

“StoNA: Structure to Network Activity". HSCB Focus 2011, Feb 8-10, Chantilly, VA. (Dalton, J., Porter, M.D., Abrams, M., and Valore, J.)

2010   “Self-exciting Hurdle Models for Terrorism". AMS Fall Western Section Meeting, Oct 9-10, Los Angeles, CA.

“Is Terrorism Contagious? Modeling Indonesian Terrorism with Self-Exciting Hurdle Models". Joint Statistical Meetings, Aug. 1-5, Vancouver, BC.

“Discovering Terrorist Subgroups with Network Neighborhood Analysis". Quantitative Methods in Defense and National Security, May 25-26, George Mason University.

“Network Neighborhood Analysis". IEEE Intelligence and Security Informatics, May 23-26, Vancouver, BC. (Smith, R. and Porter, M.D.)

2009   “Modeling Site Selection Behavior: Applications to Crime and Terrorism". Joint Statistical Meetings, Aug. 1-6, Washington, D.C.

2008   “Mixture Likelihood Ratio Scan Statistic for Disease Outbreak Detection". International Society for Disease Surveillance (ISDS) annual conference, Dec 3-5, Raleigh, NC. (Neimi, J.B., Porter, M.D., and Reich, B.J.)

“Probability Estimates for Footwear Evidence". NC IAI Fall Conference, October 2-3, Atlantic Beach, NC.

“Probability Estimates for Footwear Evidence". International Association for Identification 93rd International Educational Conference, August 17-23, Louisville, KY.

“A Martingale Methodology for the Quick Identification of Point Process Anomalies". INTERFACE 2008, May 21-24, Durham, NC.

2007   “An Adaptive Methodology for the Quick Identification of Space-Time Anomalies". INFORMS annual meeting, Nov 4-7, Seattle, WA.

“The Search for Spatial and Spatio-Temporal Anomalies". Army Conference on Applied Statistics, Oct 17-19, Rice University.

“Some adaptive approaches for space-time anomaly detection". First International Workshop in Sequential Methodologies, July 22-25, Auburn University.

“Change detection for space-time Poisson point processes with applications to defense and homeland security". Spring Research Conference on Statistics in Industry and Technology, May 21-23, Iowa State University.

“Anomaly Detection in Space-Time Point Processes". 32nd Spring Lecture Series, Spatial and Spatio-Temporal Statistics, Apr. 12-14, University of Arkansas.

“Anomaly Detection in Space-Time (and higher dimensional) Point Processes". Quantitative Methods in Defense and National Security, Feb. 7-8, George Mason University.

2006   “Modeling the Interaction between Intelligent Site Selection and Other Stochastic Processes with Applications to Terrorism". Joint Statistical Meetings, Aug. 6-10, Seattle, WA. (Robinson, C.D., Porter, M.D., and Brown, D.E.)

2005   “Feature Selection, Prediction, and Change Detection in Terrorist/Insurgency Processes Using a Spatial Point Process Approach". Knowledge Fusion Research Workshop, Nov. 29- Dec. 1, Annapolis, MD.

“Detecting Changes in Criminal or Terrorist Processes". SAMSI National Defense and Homeland Security Kickoff Workshop, Sept. 11-14, RTP, NC.

“Finding Changing Crime Regions: Use of High Dimensional Geographic Feature Space and Classification Trees". Proceedings of the Eighth Crime Mapping Research Conference, Sept. 7-10, Savannah, GA.

2003   “A Modified Response Surface Methodology for Knowledge Discovery: Optimization via Functional Approximation". Poster Presentation. Winter Simulation Conference, Dec. 7-10, New Orleans, LA.

	"Obsolescence Management Decision Making in a Life-Cycle Extension". Proceedings of Third COG Conference. May 19-22, 2003, Glasgow, Scotland.
2002	"Functional Discovery to Enable Confident Change". Proceedings of Fifteenth International Conference on Systems Engineering. August 6-8, 2002, Las Vegas, NV. pp. 273-277. (Tomlinson, J., Porter, M.D., and Mahaffey, W.R.)

OTHER TALKS

2018	*Modeling contagion, excitation, and social influence with Hawkes point processes.* University of Virginia, Department of Statistics, Nov 30, 2018.
	Modeling contagion, excitation, and social influence with Hawkes point processes. University of Virginia, Data Science Institute, April 17, 2018.
2015	*Self-exciting Hurdle Models for Terrorist Activity.* Mississippi State University, Statistics Seminar, April 7, 2015.
2014	*Predictive Crime Analytics.* Cambridge, MA, Aug 11-12 2014.
2013	*Statistical Crime Series Linkage.* The University of Alabama, Applied Statistics Seminar, Sept 30, 2013.
	Self-exciting Hurdle Models for Terrorist Activity. The University of Alabama, Applied Statistics Seminar, Feb 20, 2013.
	Analyzing Terrorist Attack Patterns with Self-exciting Models. Daniel Rose Yale-Technion Counterterror Research Initiative Seminar, Feb 26, 2013 Yale University.
2011	*Self-exciting Hurdle Models for Terrorism: Understanding the Risk of Indonesian Terrorist Attacks.* University of Louisville, Mathematics Colloquium, Mar 4, 2011.
2008	*Regression and Least Squares: A Matlab Tutorial.* SAMSI/CRSC Undergraduate Workshop, N.C. State University, Raleigh, NC., May 19 23, 2008.
	Cluster Detection in Geographic Sensor Networks. SAMSI Undergraduate Workshop, RTP, NC. February 29-March 1, 2008.
2007	*Intelligent Site Selection Models for Asymmetric Threat Prediction and Decision Making.* SAMSI Undergraduate Workshop, Durham, NC, November 9-10, 2007.
	The Search for Spatial and Spatio-Temporal Anomalies. Virginia Tech, Department of Statistics, August 30, 2007.
	Which targets are next? Modeling Intelligent Site Selection with Applications to Terrorism. Applications of Statistical Modeling and Simulation, University of Delaware, April 27, 2007.
	Anomaly Detection in Space-Time (and higher dimensional) Point Processes. North Carolina State University, Department of Statistics, February 22, 2007.
	Intelligent Site Selection and Anomaly Detection. ADAC Lab, North Carolina State University, Department of Electrical and Computer Engineering, February 15, 2007.
2006	*Anomaly Detection in Space-Time (and higher dimensional) Point Processes.* University of South Carolina, Department of Statistics, October 26, 2006.
	Anomaly Detection in Space-Time Point Processes. Ninth Meeting of New Researchers in Statistics and Probability, August 1-5, 2006, Seattle, WA.
	Using Marked Spatial Point Process Models to Detect Change in Intelligent Site Selection Processes. University at Buffalo, Department of Systems and Industrial Engineering, April 3, 2006.
	Using Point Process Residuals in Space-Time Anomaly Detection. SAMSI Anomaly Detection Working Group Meeting, March 23, 2006.

TEACHING

University of Virginia

SYS 6018	*Data Mining*: Sp 19, Fa 19, Su 20, Fa 20

SYS 4055	*Systems Engineering Design Colloquium II*: Fa 18, Fa 19, Fa 20
SYS 3055	*Systems Engineering Design Colloquium I*: Fa 18
SYS 2202	*Data and Information Engineering*: Fa 19
GBUS 7600	*Data Analysis and Optimization (DAO)*: Sp 19

University of Alabama

ST 697	*Advanced Statistical Learning*: Sp 14, Fa 15, Fa 17
ST 597	*Introduction to Data Analytics*: Sp 15, Sp 16, Sp 17
ST 591	*Introduction to Statistical Learning*: Fa 16, Su 17
ST 560	*Statistical Methods*: Fa 15, Fa 16
ST 554	*Mathematical Statistics I*: Fa 16, Fa 17
ST 260	*Statistical Data Analysis*: Fa 13, Sp 14, Fa 14, Sp 15, Sp 16, Sp 18

North Carolina State University

ST 516	*Experimental Statistics for Engineers II*: Sp 08
ST 515	*Experimental Statistics for Engineers I*: Fa 06, 07
ST 371	*Probability and Distribution Theory*: Sp 07

SERVICE ACTIVITIES

2019+	Systems Engineering Undergrad Committee, Engineering Systems & Environment Department
2019+	Partnership Chair, SIEDS Steering Committee
2019+	SDS Academic Affairs Committee
2019+	SDS Graduate Education Committee
2019–2020	General Chair, Forecasting for Social Good Workshop
2020	Distinguished Fellow Review Committee, School of Engineering and Applied Science
2019	Task force on Colloquium, Engineering Systems & Environment Department
2017–2018	Guest editor International Journal of Forecasting special edition: *Forecasting for Social Good*
2016–2018	Technology Research Advisory Committee, University of Alabama
2015–2018	Medicaid Research Committee, Culverhouse College of Commerce
2016–2018	Business Analytics Steering Committee, Culverhouse College of Commerce
2014–2016	MS-Business Analytics Committee, ISM Dept, University of Alabama
2013–2016	Research Advisory Committee, University of Alabama
2013–2014	Secretary/Treasurer of the American Statistical Association Section on Defense and National Security (ASA-SDNS)
2013+	Grant reviewer for National Institute of Justice (NIJ) Graduate Research Fellowship (2013, 2016, 2019)
2009–2010	Publications Officer of the American Statistical Association Section on Defense and National Security (ASA-SDNS)
2007+	Program committee for Quantitative Methods in Defense and National Security (QMDNS) conference (2007, 2010, 2012)
2005+	Article reviews for JASA, CSDA, Annals of Applied Statistics, International Journal of Forecasting, Biostatistics, Biometrics, Journal of Applied Statistics, Criminology, Legal and Criminological Psychology, Crime Mapping, Journal of Experimental Criminology, Journal of Quantitative Criminology, NetCrime, Journal of Forensic Science, IEEE Transactions on SMC, Mathematical and Computer Modeling, Forest Science, Annals of GIS, Applied Geography, Int. J. of Information Technology and Decision Making, Decision Sciences, Homeland Security Technologies.

OTHER ACTIVITIES

2014	Statistical Training: Predictive Crime Analytics Workshop, Aug 11-12, Cambridge, MA. Led two-day workshop on geospatial predictive methods for crime analysts.
2007–2008	Director of VIGRE Undergraduate Research Project: Examining Footwear Evidence for Identification
2008	Session organizer "Spatial Risk Mapping: Prediction and Change Detection", Interface 2008, Durham, NC, May 2008.
2007	Attended IPAM Crime Hot Spots: Behavioral, Computational and Mathematical Models
2006	Session organizer "Prediction and Detection in Defense and Homeland Security Applications", Joint Statistical Meetings Seattle, WA, August 2006

AWARDS

2007	Louis T. Rader Outstanding Ph.D. Student Award, awarded by the Department of Systems and Information Engineering, University of Virginia, Charlottesville
2006	Winner of the Student Paper Competition for ASA Section on Statistics in Defense and National Security (ASA-SDNS)
2005	NSF travel award for NATO ASI (Advanced Study Institute): Multisensor Data and Information Processing for Rapid and Robust Situation and Threat Assessment
2005	Travel award for the Eighth Crime Mapping Research Conference, Savannah, GA.
2005	Travel award for the SAMSI National Defense and Homeland Security Kickoff Workshop, RTP, NC.