

Alex Reinhart

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Education

- May 2018 **Ph.D. Statistics, Carnegie Mellon University.**
Thesis supervised by Joel Greenhouse, on self-exciting point process models of crime.
- 2014 **M.S. Statistics, Carnegie Mellon University.**
- 2013 **B.S. Physics, University of Texas at Austin, Highest honors.**
Dean's Scholars Honors. Honors thesis supervised by Alex Athey and Roy Schwitters, titled "An integrated system for gamma-ray spectral mapping and anomaly detection."

Positions

- 2012 – 2013 **Research & Development Intern, Applied Research Laboratories, Austin, Texas.**
Developed techniques to monitor wide areas for the introduction of hidden radioactive sources using spatial statistics and mobile gamma spectrometers. Wrote Python code for data collection and analysis and conducted field experiments. Co-inventor of US patent application 15/117,031.

Publications

Submitted

1. Oscar Hernan Madrid Padilla, Alex Athey, Alex Reinhart, and James G. Scott. "Sequential nonparametric tests for a change in distribution: an application to detecting radiological anomalies." Submitted, November 2016. arXiv: 1612.07867.

Journal articles

2. Alex Reinhart. "A Review of Self-Exciting Spatio-Temporal Point Processes and Their Applications." *Statistical Science*, 2018. arXiv: 1708.02647. Forthcoming, with invited discussion.
3. Alex Reinhart and Joel Greenhouse. "Self-exciting point processes with spatial covariates: modeling the dynamics of crime." *Journal of the Royal Statistical Society: Series C*, 2018. DOI: 10.1111/rssc.12277. arXiv: 1708.03579. Forthcoming.
4. Wesley Tansey, Alex Athey, Alex Reinhart, and James G. Scott. "Multiscale spatial density smoothing: an application to large-scale radiological survey and anomaly detection." *Journal of the American Statistical Association* 112 (519), pp. 1047–1063, October 2017. DOI: 10.1080/01621459.2016.1276461. arXiv: 1507.07271.
5. Alex Reinhart, Valérie Ventura, and Alex Athey. "Detecting changes in maps of gamma spectra with Kolmogorov–Smirnov tests." *Nuclear Instruments and Methods in Physics Research A* 802, pp. 31–37, December 2015. DOI: 10.1016/j.nima.2015.09.002. arXiv: 1507.06954.
6. Alex Reinhart, Alex Athey, and Steven Biegalski. "Spatially-Aware Temporal Anomaly Mapping of Gamma Spectra." *IEEE Transactions on Nuclear Science* 61 (3), pp. 1284–1289, June 2014. DOI: 10.1109/TNS.2014.2317593. arXiv: 1405.1135.

Commentaries and popular press

7. Alex Reinhart and Daniel S. Nagin. "The Next Step: A Spatiotemporal Statistical Model of the Birth and Death of Crime Hotspots." *Jerusalem Review of Legal Studies* 15 (1), pp. 55–60, June 2017.
DOI: 10.1093/jrls/jlx007.
URL: <https://www.refsmmat.com/files/papers/jrls.pdf>.
8. Alex Reinhart. "Response to 'Crime Places in Context'" *Journal of Quantitative Criminology* 32 (4), pp. 723–724, December 2016.
DOI: 10.1007/s10940-016-9299-4.
URL: <https://www.refsmmat.com/files/papers/jqc-letter.pdf>.
9. Joseph Bernstein. "Not the last word: Inigo Montoya and statistical significance." *Clinical Orthopaedics and Related Research* 474 (6), pp. 1370–1374, April 2016.
DOI: 10.1007/s11999-016-4814-3. Invited commentary.
10. Alex Reinhart. *Statistics Done Wrong*. No Starch Press, March 2015. ISBN: 978-1-59327-6201.
URL: <https://www.statisticsonewrong.com>.
11. Alex Reinhart. "Huff and puff." *Significance* 11 (4), pp. 28–33, October 2014.
DOI: 10.1111/j.1740-9713.2014.00765.x.
URL: <https://www.refsmmat.com/files/papers/huff.pdf>.

Teaching

- Fall 2015, Fall 2016, Fall 2017 **Statistical Computing**, *Carnegie Mellon University*.
Co-instructor (with Christopher Genovese) of *36-750 Statistical Computing*, an introduction to software engineering, data structures, algorithms, and databases, focusing on statistical applications. Helped design the course, developed content, set projects, wrote assignments, held office hours, and gave lectures. Part of the required Statistics Ph.D. and MSP curriculum.
- Spring 2017, Fall 2017 **Teaching Statistics reading group**, *Carnegie Mellon University*.
Helped organize a department reading group on topics in statistics education, discussing the introductory curriculum, pedagogy, and statistics education research. Helped design and run a pilot study using think-aloud interviews to develop assessments of student understanding of introductory statistics concepts.
- 2014 – 2016 **Summer instructor**, *Carnegie Mellon University*.
Instructor for summer sessions of Statistical Reasoning and Practice, Experimental Design for Behavioral and Social Sciences, and Introduction to Probability Theory.

Teaching assistant

- 36-309 Experimental Design
- 36-707 Regression Analysis
- PHY 355 Modern Physics
- 36-202 Statistical Methods
- 36-226 Intro to Statistical Inference
- SSC 325H Honors Statistics

Presentations

- Nov. 2017 Alex Reinhart and Daniel S. Nagin. "A Spatio-Temporal Statistical Model of Crime Hotspots." American Society of Criminology Annual Meeting, Philadelphia, PA.
- Oct. 2017 Alex Reinhart. "Point process modeling with spatiotemporal covariates for predicting crime." (*Invited.*) Workshop on Social Interactions and Crime, University of Chicago, IL.

- Aug. 2016 Alex Reinhart, Xizhen Cai, and Joel Greenhouse. "Point process modeling with spatiotemporal covariates for predicting crime." Joint Statistical Meetings, Chicago, IL.
- Oct. 2014 Alex Reinhart. "Statistics Done Wrong: Pitfalls of Experimentation." (*Invited.*) The LASER Workshop, Washington, DC. <http://2014.laser-workshop.org/>

Posters

- Mar. 2018 Alex Reinhart and Joel Greenhouse. "Point Process Modeling with Spatiotemporal Covariates for Predicting Crime." Pittcon, Orlando, FL.
- Oct. 2017 P Burckhardt, P Elliott, S Hyun, K Lin, A Luby, CP Makris, J Orellana, A Reinhart, J Wiecek, G Weinberg, and R Nugent. "Assessment of Student Learning and Misconception Identification in Intro Statistics." CMU Eberly Teaching and Learning Summit, Pittsburgh, PA.

Projects

- 2012 – 2015 **Statistics Done Wrong**, *StatisticsDoneWrong.com*.
Wrote *Statistics Done Wrong*, a guide to statistical errors commonly committed by scientists, first published online and then expanded for print publication in March 2015 by No Starch Press. Over 30,000 copies sold; translated into German, Korean, Japanese, Chinese, and Italian (forthcoming).
"If you analyze data with any regularity but aren't sure if you're doing it correctly, get this book."
— *FlowingData*
"Of all the books that tackle these issues... the most succinct, accessible and accurate" — *Science News*

Grants and awards

- May 2017 Carnegie Mellon Department of Statistics Student Teaching Award
- 2016 – 2018 National Institute of Justice Graduate Research Fellowship (GRF-STEM, \$49,548/yr)
- 2013 – Member, Phi Beta Kappa and Sigma Pi Sigma physics honors society
- 2009 – 2013 C. Benson Branch Science Scholarship
- 2009 – 2013 Natural Sciences 21st Century Endowed Presidential Scholarship

Service

- Peer reviewer for *Statistics in Medicine* and *Health Education Journal*

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