

# Nicholas A. James

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## EDUCATION

**Cornell University.** Ithaca, NY

**Ph.D.** Operations Research (2015)

*Dissertation:* Multiple Change Point Analysis of Multivariate Data via Energy Statistics

*Committee:* David S. Matteson (chair), Robert A. Jarrow, James Renegar

**University of Florida.** Gainesville, FL

**B.S.** Mathematics (2010) GPA: 3.82

*Minor:* Computer Science

*Honors Thesis:* The Generalized Riemann Hypothesis and the Cesáro Operator

*Advisor:* Michael T. Jury

## EMPLOYMENT

- Google Inc. Software Engineer August 2015 – Present
- Twitter Inc. Data Science Internship April 2014 – October 2014
  - Created R and C++ programs to improve change point detection within system and site metrics.
  - Developed procedure to model key metrics during times of heavy user activity.
- National Security Agency Internship May 2012 – August 2012
  - Created and maintained C++ and Perl programs for managing error-correcting software.
- Florida Department of Revenue Internship June 2009 – August 2009
  - Maintained department database and case records.

## FELLOWSHIPS AND AWARDS

- Best Student Paper Award, “Efficient Multivariate Analysis of Change Points,” R/Finance Conference May 2015
- Best Academic Paper Award, “Locally Stationary Vector Processes and Adaptive Multivariate Modeling,” Applied Finance with R Conference May 2013
- Benjamin Miller Fellowship, Cornell University December 2012
- National Physical Sciences Consortium Fellowship August 2010 – July 2015
- Sloan Fellowship, Cornell University August 2010 – July 2015
- Top 17% on William Lowell Putnam Competition December 2008
- Platinum Scholarship, University of Florida August 2006 – May 2010

## RESEARCH INTERESTS

- Multivariate Time Series
- Dimension Reduction
- Financial Econometrics
- Machine Learning
- Signal Processing

## PUBLICATIONS

- James, N.A. and Matteson, D.S. (2015), “Change Points via Probabilistically Pruned Objectives”, *Submitted, arXiv:1505.04302*
- Matteson, D.S., James, N.A., and Nicholson, W. (2015), “Statistical Measures of Dependence for Financial Data”, In Akansu, A.N., Kulkarni, S.R., Pollak, I., and Malioutov, D. (Eds.), *Financial Signal Processing and Machine Learning, Wiley-IEEE*
- James, N.A. and Matteson, D.S. (2015), “ecp: An R Package for Nonparametric Multiple Change Point Analysis of Multivariate Data,” *Journal of Statistical Software, Vol. 62, Num. 7.*
- James, N.A., Kejariwal A., and Matteson D.S., “Leveraging Cloud Data to Mitigate User Experience from *Breaking Bad*”, *arXiv:1411.7955*
- Matteson, D.S. and James, N.A. (2014), “A Nonparametric Approach for Multiple Change Point Analysis of Multivariate Data,” *Journal of the American Statistical Association, Vol. 109, Num. 505: 334–345.*
- Matteson, D.S., James, N.A., Nicholson, W. and Segalini, L. (2013), “Locally Stationary Vector Processes and Adaptive Multivariate Modeling,” *Acoustics, Speech and Signal Processing, IEEE, 8722 – 8726.*
- Edwards, S., Elandt, V., James, N., Johnson, K., Mitchell, Z., and Stephenson, D. (2010), “Lights Out on Finite Graphs,” *Involve, Vol. 3, Issue 1: 17–32.*

## CURRENT RESEARCH

- Risk, B.B., James, N.A. and Matteson, D.S., “multidcov: An R Package for Independent Component Analysis and Test of Independence via Multivariate Distance Covariance,” *In Preparation.*

## PRESENTATIONS

- “Efficient Multivariate Analysis of Change Points”
  - R/Finance Conference, University of Illinois at Chicago May 2015
- “Change Point Detection in the Presence of Anomalies”
  - Time Dynamic Change Point Models and its Applications, Göttingen University October 2014
- “Locally Stationary Vector Processes and Adaptive Multivariate Modeling”
  - ORIE Ph.D. Colloquium, Cornell University December 2013
- “A Nonparametric Approach for Multiple Change Point Analysis of Multivariate Data”
  - Low-dimensional Structure in High-dimensional Systems Summer School, SAMSI August 2013
  - New England Statistical Symposium, University of Connecticut April 2013
  - Statistics Ph.D Seminar, Cornell University February 2013
  - ORIE Ph.D. Colloquium, Cornell University November 2012

## SOFTWARE

- R Package: ecp, Change Point Analysis, with Matteson, D.S. 2013
  - <http://cran.r-project.org/web/packages/ecp/index.html>
- R Package: BreakoutDetection, Change Point Analysis, with Kejariwal, A. and Matteson, D.S. 2014
  - <https://github.com/twitter/BreakoutDetection>

## TEACHING

### Cornell University

- Teaching Assistant, Operations Research Tools for Financial Engineering August 2013 – December 2013

### University of Florida

- Mathematics Tutor August 2009 – August 2010
  - Tutored students in precalculus and calculus.
  - Led both group and individual tutoring sessions.
- Course Assistant, Precalculus August 2008 – December 2008
  - Three sections of precalculus each with around 25 undergraduate students.
  - Reviewed material covered in current week’s lectures and administered weekly quizzes.

## PROFESSIONAL SERVICE AND MEMBERSHIPS

- Referee
  - Electronic Journal of Statistics 2015
  - Journal of the American Statistical Association 2014 & 2015
  - Environmental Modelling & Software 2014
  - Statistical Analysis and Data Mining 2013
- Member
  - American Statistical Association 2013 – Present
  - Institute of Mathematical Statistics 2013 – Present

## COMPUTING

- Programming Languages
  - C/C++
  - Python
  - Java
  - R
  - Perl
- Operating Systems
  - Linux and other Unix-like systems
  - Microsoft Windows