

# Benjamin J. Radford

POLITICAL SCIENTIST · DATA SCIENTIST · TS/SCI

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## Education

### Ph.D. in Political Science

DUKE UNIVERSITY

Durham, NC

2016

Subfields: Political Methodology and Security, Peace, & Conflict

*Automated Learning of Event Coding Dictionaries for Novel Domains with an Application to Cyberspace*

### M.A. in Political Science

DUKE UNIVERSITY

Durham, NC

2013

### B.A. in Mathematics and International Studies

UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE

Asheville, NC

2010

## Research Experience

### Principal Investigator & Principal Data Scientist

DARPA I2O (Cyber Incident Attribution PROGRAM), SOTERA DEFENSE SOLUTIONS

Arlington, VA

2017–Present

### Participant and Evaluator

DARPA PROBABILISTIC PROGRAMMING FOR ADVANCED MACHINE LEARNING SUMMER SCHOOL

Arlington, VA

July–Aug., 2017

### Principal Data Scientist

DARPA I2O (Network Defense PROGRAM), SOTERA DEFENSE SOLUTIONS

Arlington, VA

2016–2018

### Senior Data Scientist

DARPA I2O (Network Defense PROGRAM), CAERUS ASSOCIATES

Arlington, VA

2015–2016

### Research Assistant to Professor Michael D. Ward

DUKE UNIVERSITY

Durham, NC

2013–2015

### Research Assistant to Professor Joseph M. Grieco

DUKE UNIVERSITY

Durham, NC

2012–2013

### Intern

JAMES MARTIN CENTER FOR NONPROLIFERATION STUDIES

Washington, D.C.

2008

## Selected Publications

### “Automated Dictionary Generation for Political Event Coding”

Conditionally Accepted at *Political Science Research and Methods*.

2018

### “Anomaly Detection in Cyber Network Data Using a Cyber Language Approach”

Prepared for the 2018 ASA Symposium on Data Science and Statistics. Available at arXiv:1808.10742.

with Bartley D. Richardson, Shawn E. Davis, Keegan Hines, and David Pekarek.

2018

### “Sequence Aggregation Rules for Anomaly Detection in Computer Network Traffic”

Prepared for the 2018 ASA Symposium on Data Science and Statistics. Available at arXiv:1805.03735.

with Bartley D. Richardson and Shawn E. Davis.

2018

### “Network Traffic Anomaly Detection Using Recurrent Neural Networks”

*Proceedings of the 2017 MSS National Symposium on Sensor & Data Fusion.*

with Leonardo Apolonio, Antonio Trias, and Jim A. Simpson.

2017

### “Enemy at the Gates: Variation in Economic Growth from Civil Conflict.”

*Journal of Conflict Resolution.*

with Shahryar Minhas.

2017

- “Small-scale prediction of IEDs in Afghanistan using split-population duration regression”** 2015  
Submitted to the Office of Naval Research.  
with Andreas Beger and Michael D. Ward.
- “Comparing GDELT and ICEWS Event Data”** 2013  
Published online via Research Gate.  
with Michael D. Ward, Andreas Beger, Josh Cutler, Matthew Dickenson, and Cassy Dorff.
- “The Evolution of US Policy towards Iran’s Nuclear Program: Lessons for the Obama Administration”** 2010  
*UNC Asheville Journal of Undergraduate Research.*
- “Iran Likely to Take Accusatory Stance at CWC Review Conference”** 2008  
*WMD Insights* (April): 39-43.
- “Summary of Recent United Nations Security Council, European Union, and United States Sanctions Against Iran”** 2008  
*WMD Insights* (April): 44-50.  
with Leonard Spector.
- “Algeria, Emirates Plan Nonproliferation-Friendly Nuclear Programs; Egypt Keeps Fuel Cycle Options Open, Rejects Expanded IAEA Monitoring”** 2008  
*WMD Insights* (June): 2-7.  
with Leonard Spector.

## Software

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- mmtsne** 2017  
A package for estimating *multiple maps t-distributed stochastic neighbor embedding* (multiple maps t-SNE) models in R.  
Open source and available on CRAN: <https://cran.r-project.org/package=mmtsne>.

## Selected Working Papers

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- “Multilingual Word Embedding for Zero-Shot Text Classification”** *Working paper*  
with Yaoyao Dai.
- “Varieties of Authoritarianism and Peace through Trade, 1950-1999”** *Under review*  
with Joseph Grieco and Christopher Gelpi.

## Selected Conferences

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- Conference Papers** *Boston, MA*  
ANNUAL MEETING OF THE AMERICAN POLITICAL SCIENCE ASSOCIATION *Aug. 2018*  
“Automated Dictionary Generation for Political Event Coding”  
“Multilingual Word Embedding for Zero-Shot Text Classification”  
“Going Ballistic: Nuclear Bursts in North Korea and Outbursts on Twitter”
- Invited Talk** *Reston, VA*  
AMERICAN STATISTICAL ASSOCIATION SYMPOSIUM ON DATA SCIENCE AND STATISTICS *May 2018*  
“Sequence Aggregation Rules for Anomaly Detection in Computer Network Traffic”
- Conference Paper** *Springfield, VA*  
MILITARY SENSING SYMPOSIUM, NATIONAL SYMPOSIUM ON SENSOR & DATA FUSION *Oct. 2017*  
“Network Traffic Anomaly Detection Using Recurrent Neural Networks”
- Invited Talk** *Washington, D.C.*  
CONFERENCE ON APPLIED STATISTICS IN DEFENSE, AMERICAN STATISTICAL ASSOCIATION *2016*  
“Cyber Language: Enhancing Cybersecurity Through Statistical and Natural Language Processing Techniques”

### Conference Paper

ANNUAL MEETING OF THE INTERNATIONAL STUDIES ASSOCIATION

"Small-scale prediction of IEDs in Afghanistan using split-population duration regression"

New Orleans, LA  
2015

### Conference Paper

ANNUAL MEETING OF THE AMERICAN POLITICAL SCIENCE ASSOCIATION

"Enemy at the Gates: Variation in Economic Growth from Civil Conflict"

San Francisco, CA  
2015

### Conference Paper

ANNUAL MEETING OF THE MIDWEST POLITICAL SCIENCE ASSOCIATION

"Enemy at the Gates: Variation in Economic Growth from Civil Conflict"

Chicago, IL  
2015

### Conference Paper

DUKE-UNC INTERNATIONAL RELATIONS WORKSHOP

"Embargoes and the Regional Small Arms Trade"

Durham, NC  
2014

### Conference Paper

ANNUAL MEETING OF THE MIDWEST POLITICAL SCIENCE ASSOCIATION

"Varieties of Authoritarianism and Peace through Trade, 1950-1999"

Chicago, IL  
2014

### Conference Paper

ANNUAL MEETING OF THE MIDWEST POLITICAL SCIENCE ASSOCIATION

"Autocracy Type and Conflict Outcome: Assessing the Relative Performance of Personalist Regimes in War"

Chicago, IL  
2013

### Conference Paper

ANNUAL MEETING OF THE SOUTHERN POLITICAL SCIENCE ASSOCIATION

"Primed for Defense: How I Learned to Start Worrying and Love the Bomb"

Orlando, FL  
2013

## Academic Service

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### Reviewer

POLITICAL SCIENCE RESEARCH & METHODS

2017

### Discussant

ANNUAL MEETING OF THE AMERICAN POLITICAL SCIENCE ASSOCIATION

Panel on Prediction

2015

### Reviewer

INTERNATIONAL STUDIES REVIEW

2015

## Grants, Honors, & Awards

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2011–2016 **Graduate Studies Fellowship**, Duke University

Durham, NC

2015, 14, 13 **Graduate School Conference Travel Fellowship**, Duke University

Durham, NC

2013 **Finalist**, Data Visualization Contest, Duke University

Durham, NC

2010 **Graduated summa cum laude**, University of North Carolina at Asheville

Asheville, NC

2010 **Top Graduating Math Student**, University of North Carolina at Asheville

Asheville, NC

2010 **Distinction in International Studies**, University of North Carolina at Asheville

Asheville, NC

2010 **Finalist**, Hasbro NERF *Battle of the Ads*

## Teaching Experience

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### Invited Lecture

GEORGE MASON UNIVERSITY

CSI 899: *Computational Research and Applications*

Arlington, VA  
Nov. 2017

### Teaching Assistant for Professor Kyle Beardsley

DUKE UNIVERSITY

POLSCI 130: *Introduction to Political Inquiry*

Durham, NC  
2013

## Programming

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- R
- Python
- Scala
- Spark
- $\text{\LaTeX}$
- MapReduce
- Hadoop & HDFS
- SQL

## Research Interests

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- Machine learning & artificial intelligence
- Statistics
- Deep learning & multitask modeling
- Cybersecurity & cyber conflict
- Forecasting & prediction
- Political methodology
- Information extraction
- Political security and conflict
- WMD & counter-proliferation