

# Iain Carmichael

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[github.com/idc9](https://github.com/idc9) 🐙  
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## EDUCATION

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**The University of North Carolina at Chapel Hill**, Chapel Hill, NC (expected) May 2019  
Ph.D. Statistics  
Department of Statistics and Operations Research  
Thesis: *Topics in the analysis of non-standard data including: networks, text and images*  
Advisors: Shankar Bhamidi, J.S. Marron

**Cornell University**, Ithaca, NY May 2014  
B.A. Mathematics (Cum Laude), Physics (Cum Laude)

**Budapest Semesters in Mathematics**, Budapest, Hungary Spring 2013  
Semester abroad

## PUBLICATIONS

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### IN PREPARATION

1. Banerjee, S., Bhamidi, S., **Carmichael, I.** (2018). Nonparametric change point detection in growing networks.
2. **Carmichael, I.**, Couture, H., Niethammer M., Perou C., Marron J.S. (2018). Joint analysis of H&E stained images and genetic covariates using deep learning and JIVE.
3. **Carmichael, I.**, Jung, M., Marron, J.S. (2018). Python, R and Matlab packages for angle-based joint and individual variation explained.

### UNDER REVIEW

4. **Carmichael, I.**, Williams, JP. (2018). An exposition of the false confidence theorem. *Submitted to Stat*
5. **Carmichael, I.**, Marron, J.S. (2017). Geometric insights into support vector machine behavior using the KKT conditions. *Submitted to JMLR*.

### PUBLISHED

6. **Carmichael, I.**, Marron J.S. (2018). Data science vs. statistics: two cultures?. *Japanese Journal of Statistics and Data Science*.
7. **Carmichael, I.**, Wudel, J., Kim, M., Jushchuk, J. (2017). Examining the evolution of legal precedent through citation network analysis. *North Carolina Law Review*.

## PRESENTATIONS

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“Angle-based joint and individual variation explained,” *Joint PI Meeting: NSF BIGDATA and Big Data Hubs & Spokes*, Alexandria, VA, June, 2018. (poster) [https://idc9.github.io/assets/ajive\\_carmichael\\_nsf\\_bigdata2018\\_poster.pdf](https://idc9.github.io/assets/ajive_carmichael_nsf_bigdata2018_poster.pdf)

“Word embeddings for computational humanities,” *UNC Digital Innovation Lab*, Chapel Hill, NC, October 2017. [https://github.com/idc9/word\\_embed\\_tutorial](https://github.com/idc9/word_embed_tutorial)

“Data science and the undergraduate curriculum,” *UNC STOR Department Colloquium*, Chapel Hill, NC, September 2017. [https://idc9.github.io/assets/data\\_science\\_stor\\_colloquium.pdf](https://idc9.github.io/assets/data_science_stor_colloquium.pdf)

“Open data, networks and the law,” *PyData Carolinas*, Raleigh, NC, October, 2016.

## PROFESSIONAL EXPERIENCE

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<b>Consultant</b> , Reese News Lab, <i>Chapel Hill, NC</i>	Spring - Fall 2017
<b>Research Scientist</b> , Gamalon Machine Intelligence, <i>Cambridge, MA</i>	May - August 2016
<b>Research Internship</b> , RIPS program at IPAM in collaboration with the Aerospace Corporation, <i>UCLA, Los Angeles, CA</i>	June - August 2012

## TEACHING

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<b>Instructor</b> , STOR-BIOS Linear Algebra Summer Boot Camp, <i>UNC, Chapel Hill, NC</i>	Summer 2017
<b>Instructor</b> , STOR 390: Introduction to Data Science, <i>UNC, Chapel Hill, NC</i>	Spring 2017
· Developed and taught the first data science course for UNC’s undergraduate statistics major. <a href="https://idc9.github.io/stor390/">https://idc9.github.io/stor390/</a>	
<b>Graduate Research Consultant</b> , JOMC 390: Data Driven Journalism, <i>UNC, Chapel Hill, NC</i>	Spring 2016
<b>Teaching Assistant</b> , <i>UNC, Chapel Hill, NC</i>	
· STOR 634: Measure Theory	Fall 2015
· STOR 113: Decision Models for Business and Economics	Fall 2014 - Spring 2015

## AWARDS

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Dean’s Graduate Fellow in the College of Arts and Sciences, <i>UNC, Chapel Hill, NC</i>	2018-2019
Grant from Data@Carolina (with Shankar Bhamidi), <i>UNC, Chapel Hill, NC</i>	Fall 2016
Regional Datathon winner (team of 4 winning \$20,000 data science competition sponsored by Citadel), <i>Duke University, Durham, NC</i>	April 2017
5th place in international Data Open Championship sponsored by Citadel, <i>Manhattan, NY</i>	November 2017

## PROFESSIONAL SERVICE

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Referee for IEEE Transactions on Neural Networks and Learning Systems	
UNC middle/high school science exposition, <i>UNC, Chapel Hill, NC</i> <a href="https://github.com/idc9/UNC_science_expo_2018">https://github.com/idc9/UNC_science_expo_2018</a>	Spring 2018
Tutorials on R, Python, data science, optimization and natural language processing can be found on my github page ( <a href="https://github.com/idc9">github.com/idc9</a> )	2015 - present
Member of Evidence, Analysis, Interpretation, and Critique task force for UNC’s Curriculum Development Committee, <i>UNC, Chapel Hill, NC</i>	Spring 2017

Supervised undergraduate theses/independent research along with Shankar Bhamidi (Ethan Koch, James Jushchuk, Kate Cho, Scott Garcia, and Michael Kim), *UNC, Chapel Hill, NC* 2015 - 2018

Coach of UNC's undergraduate team competing in DataFest, *Duke University, Durham, NC* 2016 - 2017

## SOFTWARE

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### PACKAGES

**PYJIVE:** A python package implementing Angle-based Joint and Individual Variation Explained (AJIVE) for feature extraction with multiple data sets. <https://github.com/idc9/pyjive/>

**RJIVE:** An R package implementing AJIVE. [https://github.com/idc9/r\\_jive/](https://github.com/idc9/r_jive/)

**Skills:** R, Python, Matlab  $\text{\LaTeX}$ , Bash, Github