

# JACOB M. MARONGE

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## RESEARCH INTERESTS

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Experimental design, retrospective sampling, statistical computing, neuroimaging, longitudinal studies

## EDUCATION

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**University of Wisconsin-Madison**

August 2016 - Present

PhD, Statistics (Emphasis in Biostatistics)

*Advisor:* Paul J. Rathouz

**Louisiana State University Health Sciences Center**

May 2016

MS, Biostatistics

*Thesis:* “Optimal Designs for Wavelet Regression Models”

*Advisor:* Zhide Fang

**University of Wisconsin-Milwaukee**

May 2014

BS, Physics

## PROFESSIONAL EXPERIENCE

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**University of Wisconsin-Madison**

**Waisman Center**

January 2018 - Present

*Predocutorial Fellow, Morse Society Scholars Program*

*Madison, WI*

- Awarded membership to the Morse Society Scholars Program. This fellowship offers a unique training opportunity to graduate students in multiple disciplines who are conducting research in the areas of developmental psychopathology and the psychiatric aspects of developmental disabilities.

**University of Wisconsin-Madison**

**School of Medicine and Public Health, Department of Biostatistics and Medical Informatics**

September 2017 - Present

*Research Assistant, Advisor: Paul J. Rathouz*

*Madison, WI*

- Studying how to generalize the notion of case-control studies to non-binary responses. The aim of this work is to supply tools for the analysis of data arising from studies with outcome-dependent sampling (ODS), as well as give guidelines for the design of efficient ODS studies.

**University of Wisconsin-Madison**

**School of Medicine and Public Health, Department of Biostatistics and Medical Informatics**

August 2016 - August 2017

*NIH Predocutorial Trainee in Biostatistics, Program Director: Paul J. Rathouz*

*Madison, WI*

- Grant number: T32HL083806-10
- Performed three semester-long rotations:
  - 1.) Summer 2017: Worked with Paul J. Rathouz and Katie Hustad on a longitudinal study focusing on expressive language development of children diagnosed with Cerebral Palsy. We implemented a multivariate, longitudinal model to analyze and interpret these data.
  - 2.) Spring 2017: Worked with Michael Newton on an Empirical Bayes Method to compare covariance

matrices across multiple conditions.

3.) Fall 2016: Worked with Christina Kendzierski on analysis of single cell mRNA sequencing experiments.

## Johns Hopkins University

**Bloomberg School of Public Health, Department of Biostatistics**

*Summer Intern, Advisor: Ciprian M. Crainiceanu*

Summer 2016

Baltimore, MD

- Worked with the Statistical Methods and Applications for Research in Technology (SMART) Research Group.
- Addressed issues in segmentation of stroke ischemia patients by implementing a localized neighborhood principal components analysis approach.
- Participated in the France Life Imaging-Information Analysis and Management (FLI-IAM) Multiple Sclerosis Lesion Segmentation Challenge with John Muschelli, Elizabeth Sweeney, and Russell Shinohara. We implemented a random forest technique in the challenge.

## HONORS

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JSM Biometrics Section Young Investigator Travel Award

August 2020

Morse Society Fellowship

January 2018-Present

NIH Predoctoral Trainee in Biostatistics

August 2016-August 2017

Delta Omega Honorary Society for Public Health

May 2016

## PUBLICATIONS

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### *Under preparation:*

1. **Maronge JM**, Rathouz PJ. *Power analysis for clustered and longitudinal studies using between-within covariate decomposition.*
2. **Maronge JM**, Schildcrout JS, Rathouz PJ. *Design for retrospective studies with generalized linear models.*

### *Submitted:*

1. **Maronge JM**, Schildcrout JS, Rathouz PJ. *Generalized case-control sampling under generalized linear models. (An earlier version of this manuscript was selected for a 2020 JSM Biometrics Section Young Investigator travel award.)*
2. **Maronge JM**, Muschelli J, Crainiceanu C. *Global PCA of local moments with application to multi-sequence MRI segmentation.* Submitted.

### *Peer-Reviewed:*

1. **Maronge JM**, Zhai Y, Wiens DP, Fang Z. *Optimal designs for spline wavelet regression models*, *Journal of Statistical Planning and Inference*, 184, 94-104, 2017.
2. Tudorascu DL, Karim HT, **Maronge JM**, Alhilali L, Fakhran S, Aizenstein HJ, Muschelli J, Crainiceanu CM. *Reproducibility and bias in healthy brain segmentation: comparison of two popular neuroimaging platforms*, *Frontiers of Neuroscience*, 10, 503, 2016.

## PRESENTATIONS

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### *Invited Talks:*

1. *Generalized case-control sampling under generalized linear models.* Joint Statistical Meetings, Philadelphia, PA, August, 2020.

2. *Global PCA of local neighborhood moments with applications to MRI segmentation*. Statistical Methods in Imaging Conference, Philadelphia, PA, June 6, 2018.
3. *Empirical Bayes analysis of covariance*. University of Wisconsin Department of Biostatistics and Medical Informatics Student Seminar, Madison, WI, May 5, 2017.
4. *Single cell RNA sequencing: analysis and applications*. University of Wisconsin Department of Biostatistics and Medical Informatics Student Seminar, Madison, WI, December 16, 2016.

#### ***Posters:***

1. *Global PCA of local neighborhood moments with applications to MRI segmentation*. ENAR, Atlanta, GA, March 25, 2018.
2. *Optimal designs for wavelet regression models*. Louisiana State University Health Sciences Center School of Public Health Delta Omega Research Day, New Orleans, LA, April 20, 2016.
3. *Optimal Designs for wavelet regression models*. Louisiana State University Health Sciences Center School of Graduate Studies Research Day, New Orleans, LA, November 6, 2015.

### **PROFESSIONAL MEMBERSHIPS**

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International Biometrics Society, Eastern North American Region	January 2020 - Present
The Morse Society	January 2018 - Present
Delta Omega Honorary Society for Public Health	May 2016 - Present
American Statistical Association	April 2015 - Present

### **JOURNAL REFEREE**

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Biometrics

### **COMPUTING SKILLS**

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<b>Languages:</b>	R, SAS, MATLAB
<b>Markup:</b>	L <sup>A</sup> T <sub>E</sub> X, Markdown

### **SOFTWARE**

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**medals:** R package to implement Memory Efficient Decomposition for Analysis of Local neighborhood moments for Segmentation (MEDALS). Available on Neuroconductor and GitHub.