

# JACOB M. MARONGE

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## RESEARCH INTERESTS

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Experimental design, 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

*Predoctoral 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 properties of longitudinal data analysis and outcome-dependent sampling for complicated design structures.

**University of Wisconsin-Madison**

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

August 2016 - August 2017

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

*Madison, WI*

- Grant number: T32HL083806-10
- Performed three semester-long rotations:

**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.

**Spring 2017:** Worked with Michael Newton on an Empirical Bayes Method to compare covariance matrices across multiple conditions.

**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.

## PUBLICATIONS

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### *Peer-Reviewed:*

**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.

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.

### *Manuscripts in progress:*

**Maronge JM** & Rathouz PJ. *Power Analysis for Between and Within Subject Covariates in Longitudinal Studies*. In progress.

**Maronge JM**, Muschelli J, Crainiceanu C. *Global PCA decomposition of local neighborhood moments with applications to MRI*. In progress.

## PRESENTATIONS

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### *Invited Talks:*

*Global PCA of Local Neighborhood Moments with Applications to MRI Segmentation*. Statistical Methods in Imaging Conference, Philadelphia, PA, June 6, 2018.

*Empirical Bayes Analysis of Covariance*. University of Wisconsin Department of Biostatistics and Medical Informatics Student Seminar, Madison, WI, May 5, 2017.

*Single Cell RNA Sequencing: Analysis and Applications*. University of Wisconsin Department of Biostatistics and Medical Informatics Student Seminar, Madison, WI, December 16, 2016.

### *Posters:*

*Global PCA of Local Neighborhood Moments with Applications to MRI Segmentation*. ENAR, Atlanta, GA, March 25, 2018.

*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.

*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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**The Morse Society**  
**Delta Omega Honorary Society for Public Health**  
**American Statistical Association**

January 2018 - Present  
May 2016 - Present  
April 2015 - Present

## COMPUTING SKILLS

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**Languages:** R, SAS, MATLAB, Mathematica  
**Markup:**  $\text{\LaTeX}$ , Rmarkdown, Microsoft Office

## SOFTWARE

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