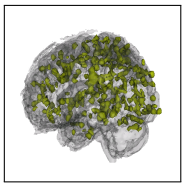

John Muschelli

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Blog: A HopStat and Jump Away
Twitter: @StrictlyStat

Research Interests

Neuroimaging, image segmentation, stroke, dynamic reports, computing, machine learning.

Education

2012–Present **PhD Candidate**, *Biostatistics*, Johns Hopkins School of Public Health, Baltimore, MD.
Expected graduation: May 2016
Areas of Study: Stoke CT image segmentation
Population-level stroke characterization
Gadolinium-Enhancing lesion segmentation of MRI in patients with MS
Advisor: Professor Ciprian Crainiceanu

2008–2010 **Master's of Science (ScM)**, *Johns Hopkins School of Public Health*, Baltimore, MD, GPA: 3.80.
Area of Study: fMRI brain image data analysis
Thesis Topic: *An Iterative Approach to Hemodynamic Response Function Temporal Derivatives in Statistical Parametric Mapping for Functional Neuroimaging*
Advisor: Professor Brian Caffo

2004–2008 **Bachelor's of Science (BS)**, *The University of Scranton*, Scranton, PA, GPA: 3.87.
Majors: Biomathematics and Neuroscience
Summa Cum Laude
Advissors: Professor Jakub Jasinski, Professor J. Timothy Cannon

Professional Experience

2009–2014 **Data Analyst / Data Manager**, *Brain Injury Outcomes Division*, Baltimore, MD.
Increased turnaround time on data safety report (from weeks to hours) by using knitr, LaTeX, and dynamic documents
Created a standardized database of CT images for analysis by developing a CT processing pipeline
Analyzed Phase II and III Clinical Trial for Treatment of Intracerebral and Intraventricular Hemorrhage
Data management and consultation of electronic case report form (eCRF) creation

2009–Present **Research Associate**, *Johns Hopkins Biostatistics Consulting Center (JHBC)*, Baltimore, MD.
Collaborated on statistical projects with senior consultants.
Report writing and analyzing data using statistical software: R, Stata

2010–2012 **Data Analyst**, *Laboratory for Neurocognitive and Imaging Research at Kennedy Krieger Institute*, Baltimore, MD.
Reduced manual steps in complex imaging study analysis using automation from programming
Analysis of functional MRI (fMRI) imaging studies using Statistical Parametric Mapping (SPM)
Programming consultant: Matlab & R

2008 **Intern**, *Analysis & Inference*, Swarthmore, PA.
Cooperated on statistical projects and conferenced with clients about possible analysis options
Report writing of analyses: Stata
Data cleaning

2007 **Research Intern**, *Dupont Stine-Haskell Laboratory*, Wilmington, DE.
Developed lab skills and techniques: cell culturing, making and sterilizing broth media, optical density readings, inoculations, quality control, cell counts, screening for fungicidal properties of compounds

Teaching Experience

2015 **Instructor**, *ENAR*, A Tutorial for Multisequence Clinical Structural Brain MRI.
Co-developed and instructed a tutorial for 35 statisticians. Created 75% of all code and slides for presentation and presented for half of the 3-hour session

2015 **Instructor**, *Coursera*, Neurohacking with R.
Co-developed a MOOC (massive open online course) for Coursera on neuroimage processing and statistical analysis completely within R. Developed 50% of code and slides for presentation and recorded lectures delivering slides.

Teaching Assistant

All teaching assistant-ships were in the Department of Biostatistics at Johns Hopkins Bloomberg of Public Health.

2015-2016 **Advanced Data Science I-II (PH.140.711-712)**, *1st-2nd term*, Instructors: Jeff Leek, PhD and Elizabeth Colantuoni, PhD.

2014-2015 **Statistical Methods in Public Health IV (PH.140.624)**, *4th term*, Instructors: James Tonascia, Ph.D and Mark Van Natta, MHS.

2014-2015 **Special topics: Statistical Consulting** , *1st-3rd term*, Instructor(s): Carol Thompson, MS and Elizabeth Colantuoni, PhD.

2013-2014 **Methods in Biostatistics I-II (PH.140.651-652)**, *1st-2nd term*, Instructor: Ciprian Craniceanu, PhD.

2012-2013 **Methods in Biostatistics III-IV (PH.140.653-654)**, *3rd-4th term*, Instructor: Hongkai Ji, PhD.

2012-2013 **Methods in Biostatistics I-II (PH.140.651-652)**, *1st-2nd term*, Instructor: Thomas Louis, PhD.

2010-2011 **Statistical Methods in Public Health IV (PH.140.624)**, *4th term*, Instructors: James Tonascia, PhD and Mark Van Natta, MHS.

2010-2011 **Statistical Methods in Public Health I (PH.140.621)**, *1st-3rd term*, Instructors: Marie Diener West, PhD and Karen Bandeen Roche, PhD.

2009-2010 **Methods in Biostatistics I-II (PH.140.651-652)**, *1st-2nd term*, Instructor: Brian Caffo, PhD.

Publications

2015 **Muschelli, J.** Ullman, N. L. Mould, W. A. Vespa, P. Hanley, D. F. Crainiceanu, C. M. "Validated automatic brain extraction of head CT images". In: *NeuroImage* 114, pp. 379–385.

Muschelli, J. Sweeney, E. Lindquist, M. Crainiceanu, C. "fslr: Connecting the FSL Software with R". In: *R JOURNAL* 7.1, pp. 163–175.

2014 **Muschelli, J.** Nebel, M. B. Caffo, B. S. Barber, A. D. Pekar, J. J. Mostofsky, S. H. "Reduction of motion-related artifacts in resting state fMRI using aCompCor". In: *Neuroimage* 96, pp. 22–35.

Muschelli, J. Sweeney, E. Crainiceanu, C. "brainR: Interactive 3 and 4d Images of High Resolution Neuroimage Data". In: *R Journal* 6.1, pp. 41–48.

Muschelli, J. Betz, J. Varadhan, R. "Binomial Regression in R". In: *Handbook of Statistics: Computational Statistics with R* 32, p. 257.

2010 **Muschelli, J.** "An Iterative Approach to Hemodynamic Response Function Temporal Derivatives in Statistical Parametric Mapping for Functional Neuroimaging". PhD thesis. Johns Hopkins University.

2015 Mould, W. A. Lovett, B. L. **Muschelli, J.** Hanley, D. F. Carhuapoma, J. R. "Impact of Blood Removal on Perihematomal Apparent Diffusion Coefficients in Patients Treated with Minimally Invasive Surgery Plus rt-PA". In: *STROKE*. Vol. 46.

2014 Eloyan, A. Li, S. **Muschelli, J.** Pekar, J. J. Mostofsky, S. H. Caffo, B. S. "Analytic programming with fMRI data: A quick-start guide for statisticians using R". In: *PloS one* 9.2, e89470.

Nebel, M. B. Joel, S. E. **Muschelli, J.** Barber, A. D. Caffo, B. S. Pekar, J. J. Mostofsky, S. H. "Disruption of functional organization within the primary motor cortex in children with autism". In: *Human brain mapping* 35.2, pp. 567–580.

2013 Mould, W. A. Carhuapoma, J. R. **Muschelli, J.** Lane, K. Morgan, T. C. McBee, N. A. Bistran-Hall, A. J. Ullman, N. L. Vespa, P. Martin, N. A. others, "Minimally invasive surgery plus recombinant tissue-type plasminogen activator for intracerebral hemorrhage evacuation decreases perihematomal edema". In: *Stroke* 44.3, pp. 627–634.

Mould, W. A. Carhuapoma, J. R. **Muschelli, J.** Hanley, D. F. "Administration of Tissue Plasminogen Activator to Patients with Spontaneous ICH Does Not Lead to an Increase in Perihematomal Edema". In: *STROKE*. Vol. 44. 2.

Mould, W. Carhuapoma, J. **Muschelli, J**, Lane, K, Morgan, T. McBee, N. Bistran-Hall, A. Ullman, N. Vespa, P, Martin, N. others, "MISTIE Investigators: minimally invasive surgery plus recombinant tissue-type plasminogen activator for intracerebral hemorrhage evacuation decreases perihematomal edema". In: *Stroke* 44.3, pp. 627–634.

Ullman, N. L. **Muschelli, J.** Li, M. Morgan, T. C. Awad, I. A. Zuccarello, M. Lane, K. Hanley, D. F. "Catheter Placement and Surgical Training in the Minimally Invasive Surgery Plus rt-PA for Intracerebral Hemorrhage Evacuation Trial". In: *STROKE*. Vol. 44. 2.

2012 Bundy, D. G. **Muschelli, J.** Clemens, G. D. Strouse, J. J. Thompson, R. E. Casella, J. F. Miller, M. R. "Ambulatory Care Connections of Medicaid-Insured Children With Sickle Cell Disease". In: *Pediatric Blood & Cancer*.

Eloyan, A. **Muschelli, J.** Nebel, M. B. Liu, H. Han, F. Zhao, T. Barber, A. D. Joel, S. Pekar, J. J. Mostofsky, S. H. others, "Automated diagnoses of attention deficit hyperactive disorder using magnetic resonance imaging". In: *Frontiers in systems neuroscience* 6.

Hanley, D. F. Zuccarello, M, Lane, K, Broaddus, W. Awad, I, Aldrich, E. Wijman, C, Vespa, P, Caron, J. Huang, J, others, "MISTIE phase II results: safety, efficacy and surgical performance". In: *CEREBROVASCULAR DISEASES*. Vol. 34, pp. 4–4.

Hinson, H. E. Melnychuk, E. **Muschelli, J.** Hanley, D. F. Awad, I. A. Ziai, W. C. "Drainage efficiency with dual versus single catheters in severe intraventricular hemorrhage". In: *Neurocritical care* 16.3, pp. 399–405.

Jaffe, J. Melnychuk, E. **Muschelli, J.** Ziai, W. Morgan, T. Hanley, D. F. Awad, I. A. "Ventricular catheter location and the clearance of intraventricular hemorrhage". In: *Neurosurgery* 70.5, p. 1258.

Webb, A. J. Ullman, N. L. Mann, S. **Muschelli, J.** Awad, I. A. Hanley, D. F. "Resolution of Intraventricular Hemorrhage Varies by Ventricular Region and Dose of Intraventricular Thrombolytic The Clot Lysis: Evaluating Accelerated Resolution of IVH (CLEAR IVH) Program". In: *Stroke* 43.6, pp. 1666–1668.

Ziai, W. C. **Muschelli, J.** Thompson, C. B. Keyl, P. M. Lane, K. Shao, S. Hanley, D. F. "Factors affecting clot lysis rates in patients with spontaneous intraventricular hemorrhage". In: *Stroke* 43.5, pp. 1234–1239.

2011 Newell, D. W. Shah, M. M. Wilcox, R. Hansmann, D. R. Melnychuk, E. **Muschelli, J.** Hanley, D. F. "Minimally invasive evacuation of spontaneous intracerebral hemorrhage using sonothrombolysis". In: *Journal of neurosurgery* 115.3, p. 592.

Niedner, M. F. Huskins, W. C. Colantuoni, E. **Muschelli, J.** Harris, J. M. Rice, T. B. Brilli, R. J. Miller, M. R. "Epidemiology of central line-associated bloodstream infections in the pediatric intensive care unit". In: *Infection Control* 32.12, pp. 1200–1208.

2010 Hinson, H. E. Melnychuk, E. **Muschelli, J.** Hanley, D. F. Ziai, W. C. "Dual Intraventricular Catheter Use in Severe Intraventricular Hemorrhage". In: *NEUROLOGY*. Vol. 74. 9, A129–A129.

Talks and Presentations

2014 **Validated Automatic Brain Extraction of Head CT Images**, *Hopkins Imaging Conference* , Talk and Poster, Award: Top Poster.

2013 **Visualizing Brain Imaging in Interactive 3D**, *ENAR*, Talk.

2014 **Reduction of motion-related artifacts in resting state fMRI using aCompCor**, *Hopkins Imaging Conference*, Poster, Award: Top Poster.

Software

R Packages

R Package **fslr: Wrapper functions for FSL (FMRIB Software Library) from Functional MRI of the Brain (FMRIB)**.

R Package **WhiteStripe: Whitestripe White Matter Normalization for Magnetic Resonance Images**.

R Package **brainR: Helper functions to misc3d and rgl packages for brain imaging**.

R Package **drammsr: Port of Deformable Registration via Attribute Matching and Mutual-Saliency Weighting (DRAMMS) Registration to R**.

R Package **extrantsr: Additional functionality and extensions to the ANTsR R package**.

R Package **dcm2niir: R wrapper for dcm2nii DICOM converter**.

R Package **matlabr: R interface with calling MATLAB code without a server**.

R Package **spm12r: R interface with calling SPM12 MATLAB processing**.

R Package **googleCite: Scraper for Google Citations**.

R Package **processVISION: Scripts for Parsing XML from VISION database**.

Skills

Programming
Proficient: R, bash, Stata, Matlab.
Beginner: SAS, Python

Markup TEX, LATEX, BIBTEX, TeXShop, WinEdt, knitr, HTML, CSS

Software platforms C++, Visual Basic, JavaScript

Honors and Awards

2014 **SOURCE (Student Outreach Resource Center) Community Service Award**.

2011 **Member of the winning team of the ADHD 200 Competition: a competition of develop diagnostic classification tools for ADHD diagnosis based on imaging of the brain**.

2004–2008 **Presidential Scholar (Full Tuition Scholarship)**.

2004–2008 **Dean's List**.

2004 **Alpha Lambda Delta**.

2008 **Alpha Sigma Nu**.

Additional Experience

2015 **IdEar Team Member**, *Hackathon: MedHacks 1.0* , Showed as proof of concept, that ears could be used as biometric markers in a global health framework. The target were areas with poor to no registries of people, such that pictures of ears could use to distinguish community members when other demographic information was not unique. Implemented a MATLAB implementation of a SVM to classify people based on image of ear and scale invariant feature transform (SIFT) features. In top 10 of 30 teams. .

2015 **Safer Baltimore Biking Team**, *Hackathon: JHU Data Science Hakathon* , Full description and product: `http://kbroman.org/jhudashbike/`. Team used open data from Baltimore city to determine road safety as measured by accidents, hazards (potholes), and accidents. Geocoded all hazards and helped develop leaflet final product (map). .

Academic Service

2014 **Organizer, Journal Club**, *JHSPH Department of Biostatistics*.
Schedule and organize club for reading and discussing statistical papers.

2013-2015 **Founder/Organizer, Writing Accountability Group**, *JHSPH Department of Biostatistics*.
Founded and organized a small group (6-8) of students, where the aim is to develop weekly goals for writing and publication.

2013-2014 **Founder/Organizer, Blogging Club**, *JHSPH Department of Biostatistics*.
Founded and organized a club for student blogging.

2013–Present **Mentor, Grand Parent**, *Thread/Incentive Mentoring Program.*
Manage a team of mentors with weekly meetings and e-mails to provide large-scale mentorship for students.

2010–2013 **Mentor, Head of Household**, *Thread/Incentive Mentoring Program.*
Mentored and tutored a student from Dunbar High School, teaching coursework, life skills, support as needed.