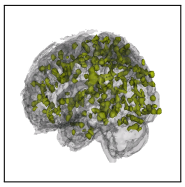

John Muschelli

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http://biostat.jhsph.edu/~ jmuschel/
Blog: A HopStat and Jump Away
Twitter: @StrictlyStat

Research Interests

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

Education

2012–Present **PhD Candidate**, *Biostatistics*,
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.
Expected graduation: May 2016
Areas of Study: Stroke CT image segmentation
Population-level stroke characterization
Gadolinium-enhancing brain lesion segmentation on MRI
Advisor: Professor Ciprian Crainiceanu

2008–2010 **Masters of Science**, *Biostatistics*,
Johns Hopkins Bloomberg 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 **Bachelors of Science**, *Biomathematics and Neuroscience*,
The University of Scranton, Scranton, PA, GPA: 3.87 (Summa Cum Laude).
Advisors: Professor Jakub Jasinski, Professor J. Timothy Cannon

Relevant Experience

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

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 and processing pipeline for CT images.
Analyzed phase II and III trials for treatment of intracerebral hemorrhage
Data management and consultation of electronic case report form (eCRF) creation.

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.
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, 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.

2014–present **Co-Instructor**, *JHSPH*, Introduction to R for Public Health Researchers.
Co-developed a one-week, 8-hour-a-day course in the Winter and Summer Institutes at Johns Hopkins with Dr. Andrew Jaffe. Developed 25% of code and slides for presentation and recorded lectures delivering slides.

Teaching Assistant

All teaching assistantships were in the Department of Biostatistics at the 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.*
Instructors: 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

Peer-Reviewed 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". *NeuroImage* 114, pp. 379–385.

Muschelli, J., Sweeney, E., Lindquist, M., Crainiceanu, C. "fslr: connecting the FSL software with R". *R Journal* 7.1, pp. 163–175.

Muschelli, J., Ullman, N. L., Sweeney, E. M., Eloyan, A., Martin, N., Vespa, P., Hanley, D. F., Crainiceanu, C. M. "Quantitative intracerebral hemorrhage localization". *Stroke*, In Press.

Choe, A. S., Jones, C. K., Joel, S. E.**, Muschelli, J.**, Belegu, V., Caffo, B. S., Lindquist, M. A., Zijl, P. C., Pekar, J. J. "Reproducibility and temporal structure in weekly resting-state fMRI over a period of 3.5 years". *PLOS ONE*, In Press.

Sweeney, E. M., Shinohara, R. T.**, Muschelli, J.**, Dewey, B. E., Reich, D. S., Crainiceanu, C. M., Schindler, M. K., Eloyan, A. "Relating multi-sequence longitudinal intensity profiles and clinical covariates in incident multiple sclerosis lesions". *NeuroImage: Clinical*, In Press.

Webb, A. J., Ullman, N. L., Morgan, T. C.**, Muschelli, J.**, Kornbluth, J., Awad, I. A., Mayo, S., Rosenblum, M., Ziai, W., Aldrich, Zuccarello, F. M., John, S., Harnof, S., Lopez, G., Broaddus, W. C., Wijman, C., Vespa, P., Bullock, R., Haines, S. J., Cruz-Flores, S., Tuhrim, S., Hill, M. D., Narayan, R., Hanley, D. F. "Accuracy of the ABC/2 score for intracerebral hemorrhage systematic review and analysis of MISTIE, CLEAR-IVH, and CLEAR III". *Stroke* 46.9, pp. 2470–2476.

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". *NeuroImage* 96, pp. 22–35.

Muschelli, J., Sweeney, E., Crainiceanu, C. "Brainr: interactive 3 and 4d images of high resolution neuroimage data". *R Journal* 6.1, pp. 41–48.

Muschelli, J., Betz, J., Varadhan, R. "Binomial regression in R". *Handbook of Statistics: Computational Statistics with R* 32, pp. 257–309.

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". *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". *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., Awad, I., Zuccarello, M., Hanley, D. F. "Minimally invasive surgery plus recombinant tissue-type plasminogen activator for intracerebral hemorrhage evacuation decreases perihematomal edema". *Stroke* 44.3, pp. 627–634.

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

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". *Pediatric Blood & Cancer* 59.5, pp. 888–894.

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". *Frontiers in Systems Neuroscience* 6, p. 6.

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". *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". *Neurosurgery* 70.5, pp. 1258–1264.

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". *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". *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". *Journal of Neurosurgery* 115.3, pp. 592–601.

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". *Infection Control* 32.12, pp. 1200–1208.

Submitted

2015 Fortin, J.-P., Sweeney, E. M.**, Muschelli, J.**, Crainiceanu, C. M., Shinohara, R. T. "Removing inter-subject technical variability in magnetic resonance imaging studies". *NeuroImage*, Submitted.

Kickingereder, P., Götz, M.**, Muschelli, J.**, Wick, A., Neuberger, U., Shinohara, R. T., Radbruch, A., Schlemmer, H.-P., Wick, W., Bendszus, M., Maier-Hein, K., Bonekamp, D. "Large-scale radiomic profiling of glioblastoma identifies an imaging signature for predicting and stratifying antiangiogenic treatment response". *Journal of Clinical Oncology*, Submitted.

Talks and Presentations

2015 **SuBGELS: Subtraction-Based Gadolinium-Enhancing Lesion Segmentation**,
Hopkins Imaging Conference, Baltimore, MD, Poster.

Automated Intracerebral Hemorrhage Segmentation of CT Scans,
Joint Statistical Meeting (JSM), Seattle, WA, SPEED Talk and Poster.

PItcHPERFECT: Primary Intracerebral Hemorrhage Prediction Employing Regression and Features Extracted from CT,
Eastern North American Region (ENAR), Miami, FL, Poster.

Quantitative Localization and Predictive Performance of Intracranial Hemorrhage,
International Stroke Conference (ISC), Nashville, TN, Poster.

Validated Automatic Brain Extraction of Head CT Images,
Organization for Human Brain Mapping (OHBM), Honolulu, HI, Poster.

2014 **Validated Automatic Brain Extraction of Head CT Images**,
Hopkins Imaging Conference, Baltimore, MD, Talk and Poster.

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

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

2012 **Resting State Preprocessing and Motion Artifacts**,
Second Biennial Conference on Resting State, Madgeburg, Germany, Poster.

Effects of preprocessing on motion-inuced artifacts in resting state fMRI,
Society for Neuroscience (SfN), New Orleans, LA, Poster.

Software

R Packages

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

WhiteStripe: Whitestripe White Matter Normalization for Magnetic Resonance Images.

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

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

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

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

dcm2niir: R wrapper for dcm2nii DICOM converter.

spm12r: R interface with calling SPM12 MATLAB processing.

rscopus: Interface with SCOPUS and Elsevier API in R.

googleCite: Scraper for Google Citations.

processVISION: Scripts for Parsing XML from VISION database.

Shiny Web Applications

2015 **Abandoned Cars in Baltimore Finder**,
https://jmuschelli.shinyapps.io/Abandoned_Baltimore_Car.

Unofficial ENAR 2015 Itinerary Maker,
https://muschellij2.shinyapps.io/ENAR_2015.

2014 **Online DICOM TO NIfTI Converter**,
https://muschellij2.shinyapps.io/dcm2nii.

Cost of most common medical procedures at United States hospitals based on Centers for Medicare and Medicaid Services data,
https://jmuschelli.shinyapps.io/Shiny_Health_Data.

Skills

Languages Proficient: R, bash, Stata, MATLAB.
Beginner: SAS, Python, C++, Visual Basic, JavaScript

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

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 a proof of concept that ears could be used as biometric markers in a global health framework. The target was areas with poor to no registries of people in which pictures of ears could be used to distinguish community members when other demographic information was not unique. Implemented a MATLAB implementation of an 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

2013–Present **Middle Manager**,
Thread/Incentive Mentoring Program.
Interfaced between executive-level staff and lower-level management. Organized monthly meetings, weekly progress updates and e-mails, and provided broad-scale mentorship for high-school students in the Baltimore City school district. Program title was "Grandparent", as it is a family-based, positive change model.

2014 **Organizer, Journal Club**,
JHSPH Department of Biostatistics.
Scheduled and organized a 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.

2010–2013 **Manager**,
Thread/Incentive Mentoring Program.
Title was a "Head of Household"; mentored and tutored a student from Dunbar High School, teaching coursework, life skills, support as needed.