

John Muschelli

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Blog: *A HopStat and Jump Away*

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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

- 2012–Present **Trainee**, *T32AG021334: Epidemiology and Biostatistics of Aging Training Grant*,
Mentors: Dr. Michelle Carlson, Dr. Ravi Varadhan.
- 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.

Software

R Packages

All download counts are from RStudio CRAN logs and are accurate as of December 25, 2015.

- CRAN **fslr: Wrapper functions for FSL (FMRIB Software Library) from Functional MRI of the Brain (FMRIB)**,
Downloads: 5837.
- WhiteStripe: Whitestripe White Matter Normalization for Magnetic Resonance Images**,
Downloads: 3363.
- brainR: Helper functions to misc3d and rgl packages for brain imaging**,
Downloads: 6699.
- matlabr: R interface with calling MATLAB code without a server**,
Downloads: 626.
- spm12r: Wrapper Functions for SPM (Statistical Parametric Mapping) Version 12 from the Wellcome Trust Centre for Neuroimaging**,
Downloads: 378.
- rscopus: Scopus Database API Interface**,
Downloads: 365.
- diffR: Display Differences Between Two Files using the Codediff JavaScript Library**,
Downloads: 275.
- 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**.
- 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.

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., Tuhim, 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 perihematoma 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 perihematoma 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.
- Bundy, D. G., **Muschelli, J.**, Clemens, G., Strouse, J., Thompson, R., Casella, J., Miller, M. “Preventive care delivery to young children with sickle cell disease”. *Journal of Pediatric Hematology and Oncology*, Submitted.

Working Groups

- 2014–Present **Statistical and Applied Mathematical Sciences Institute (SAMSI) working group on Clinical Brain Imaging.**
- 2012–Present **Epidemiology and Biostatistics of Aging (EBA) Training Program Meeting,** *Johns Hopkins University, Center on Aging and Health.*
- 2014–Present **Penn Statistical Imaging and Visualization Endeavor (PennSIVE) Working Group,** *University of Pennsylvania, Department of Biostatistics and Epidemiology.*
- 2009–Present **Statistical Methods and Applications for Research in Technology (SMART) Working Group,** *Johns Hopkins University, Department of Biostatistics.*

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.