John Muschelli

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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 January 26, 2016.

CRAN **fslr: Wrapper functions for FSL (FMRIB Software Library) from Functional MRI of the Brain (FMRIB)**,
Downloads: 6164.

WhiteStripe: Whitestripe White Matter Normalization for Magnetic Resonance Images,
Downloads: 3560.

brainR: Helper functions to misc3d and rgl packages for brain imaging,
Downloads: 6976.

matlabr: R interface with calling MATLAB code without a server,
Downloads: 903.

spm12r: Wrapper Functions for SPM (Statistical Parametric Mapping) Version 12 from the Wellcome Trust Centre for Neuroimaging,
Downloads: 586.

rscopus: Scopus Database API Interface,
Downloads: 571.

diffr: Display Differences Between Two Files using the Codediff JavaScript Library,
Downloads: 533.

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, Zuccarrello, 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.

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*, In Press.

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.