John Muschelli

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Education

2012–2016 **PhD**, *Biostatistics*,
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.
Computational Methods for Neuroimaging in R: Stroke Hemorrhage in X-ray Computed Tomography Scanning
Advisor: Ciprian Crainiceanu, PhD

2008–2010 **ScM**, *Biostatistics*,
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.
An Iterative Approach to Hemodynamic Response Function Temporal Derivatives in Statistical Parametric Mapping for Functional Neuroimaging
Advisor: Brian Caffo, PhD

2004–2008 **BS**, *Biomathematics and Neuroscience*,
The University of Scranton, Scranton, PA.
Advisors: Professor Jakub Jasinski, Professor J. Timothy Cannon

Relevant Experience

2016–Present **Assistant Scientist**, *Department of Biostatistics*, Johns Hopkins Bloomberg School of Public Health.

2012–2016 **Trainee**, *T32AG021334: Epidemiology and Biostatistics of Aging Training Grant*, Mentors: Dr. Michelle Carlson, Dr. Ravi Varadhan.

2009–2016 **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.
Decreased 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.

Software

R Packages

All download counts are from RStudio CRAN logs and are accurate as of December 09, 2016.

fslr: Wrapper Functions for FSL (FMRIB Software Library) from Functional MRI of the Brain (FMRIB),
Downloads: 9674.

brainR: Helper Functions to Misc3d and rgl Packages for Brain Imaging,
Downloads: 9271.

WhiteStripe: White Matter Normalization for Magnetic Resonance Images using Whitestripe,
Downloads: 5259.

matlabr: An Interface for MATLAB using System Calls,
Downloads: 3699.

diffr: Display Differences Between Two Files using Codediff Library,
Downloads: 2490.

rscopus: Scopus Database API Interface,
Downloads: 2483.

spm12r: Wrapper Functions for SPM (Statistical Parametric Mapping) Version 12 from the Wellcome Trust Centre for Neuroimaging,
Downloads: 2172.

oasis: Multiple Sclerosis Lesion Segmentation using Magnetic Resonance Imaging (MRI),
Downloads: 1852.

papayar: View Medical Research Images using the Papaya JavaScript Library,
Downloads: 1039.

neurobase: Neuroconductor Base Package with Helper Functions for nifti Objects,
Downloads: 917.

freesurfer: Wrapper Functions for Freesurfer,
Downloads: 525.

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.

hcp: Human Connectome Project Interface with R.

rcamino: R Port of Camino Software.

dcm2niir: R wrapper for dcm2nii DICOM converter.

ichseg: ICH Segmentation of CT scans.

msseg: MS Lesion Segmentation.

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

* denotes authors contributed equally

2017 Maier, O., Menze, B. H., von der Gablentz, J., Häni, L., Heinrich, M. P., Liebrand, M., Winzeck, S., Basit, A., Bentley, P., Chen, L., others, "Isles 2015-a public evaluation benchmark for ischemic stroke lesion segmentation from multispectral mri". *Medical Image Analysis* 35, pp. 250–269.

2016 Bundy, D. G.**, Muschelli, J.**, Clemens, G. D., Strouse, J. J., Thompson, R. E., Casella, J. F., Miller, M. R. "Preventive care delivery to young children with sickle cell disease". *Journal of pediatric hematology/oncology* 38.4, pp. 294–300.

Fortin, J.-P., Sweeney, E. M.**, Muschelli, J.**, Crainiceanu, C. M., Shinohara, R. T., Initiative, A. D. N., others, "Removing inter-subject technical variability in magnetic resonance imaging studies". *NeuroImage* 132, pp. 198–212.

Hanley, D. F., Thompson, R. E.**, Muschelli, J.**, Rosenblum, M., McBee, N., Lane, K., Bistran-Hall, A. J., Mayo, S. W., Keyl, P., Gandhi, D., others, "Safety and efficacy of minimally invasive surgery plus alteplase in intracerebral haemorrhage evacuation (MISTIE): a randomised, controlled, open-label, phase 2 trial". *The Lancet Neurology* 15.12, pp. 1228–1237.

Hanley, D. F., Lane, K., McBee, N., Ziai, W., Tuhrim, S., Lees, K. R., Dawson, J., Gandhi, D., Ullman, N., Mould, W. A., others, "Thrombolytic removal of intraventricular haemorrhage in treating severe stroke: results of the CLEAR III trial, a randomised, controlled trial". *Lancet*.

Kickingereder, P, Götz, M, **Muschelli, J,** Wick, A, Neuberger, U, Shinohara, R, Radbruch, A, Schlemmer, H, Wick, W, Bendszus, M, others, "Large-scale radiomic profiling of glioblastoma identifies an imaging signature for predicting and stratifying antiangiogenic treatment response". *RöFo-Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren*. Vol. 188. S 01, WISS301_1.

Sweeney, E. M., Shinohara, R. T., Dewey, B. E., Schindler, M. K.**, Muschelli, J.**, Reich, D. S., Crainiceanu, C. M., Eloyan, A. "Relating multi-sequence longitudinal intensity profiles and clinical covariates in incident multiple sclerosis lesions". *NeuroImage: Clinical* 10, pp. 1–17.

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* 46.11, pp. 3270–3273.

Choe, A. S., Jones, C. K., Joel, S. E.**, Muschelli, J.**, Belegu, V., Caffo, B. S., Lindquist, M. A., van Zijl, P. C., Pekar, J. J. “Reproducibility and temporal structure in weekly resting-state fmri over a period of 3.5 years”. *PloS one* 10.10, e0140134.

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.**, 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.

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.

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

2016 **Muschelli, J.**, Sweeney, E. M., Ullman, N. L., Vespa, P., Hanley, D. F., Crainiceanu, C. M. "PItcHPERFeCT: primary intracranial hemorrhage probability estimation using random forests on CT". *NeuroImage: Clinical*, 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

2016 **Processing fMRI Data in R**,
SAMSI Challenges in Functional Connectivity Modeling and Analysis Workshop, Durham, NC, Talk.

2015 **Succeeding in Undergraduate: A Message to Top Students**,
Sun Valley High School, Aston, PA, Talk.

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.