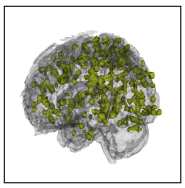

John Muschelli

Assistant Scientist
Johns Hopkins
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Blog: A HopStat and Jump Away
Twitter: @StrictlyStat
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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, GPA: 3.80.
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, GPA: 3.87 (Summa Cum Laude).
Advisors: Professor Jakub Jasinski, Professor J. Timothy Cannon

Professional 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.

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.

Research Interests

Statistical computing, neuroimaging, image segmentation, stroke, reproducibility, dynamic reports, complex data analysis.

Teaching Experience

2016 **Co-instructor**, *JHSPH*, Advanced Data Science.
Provides an intensive introduction to applied statistics and data analysis. Since both data analysis and methods development require substantial hands-on experience, focuses on hands-on data analysis.

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

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.*

Peer-Reviewed Publications

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., 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.

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.

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*, In Press.

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.**, 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

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.

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., Morgan, T. C., Ullman, N., Mould, W. A., Carhuapoma, J. R., Kase, C., Wendy Ziai, C. B. T., Yenokyan, G., Huang, E., Broaddus, W. C., Graham, R. S., Aldrich, E. F., Dodd, R., Wijman, C., Caron, J.-L., Huang, J., Camarata, P., Mendelow, A. D., Gregson, B., Janis, S., Vespa, P., Martin, N., Awad, I., Zuccarello, M., MISTIE Investigators, "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*, In Press.

Hanley, D. F., Lane, K., CMA, McBee, N., MPH, Ziai, W., Tuhrim, S., Lees, K. R., Dawson, J., Gandhi, D., Ullman, N., Mould, W. A., MPHc, Mayo, S. W., Mendelow, A. D., Gregson, B., Butcher, K., Vespa, P., Wright, D. W., Kase, C. S., Carhuapoma, J. R., Keyl, P. M., Diener-West, M.**, Muschelli, J.**, Betz, J. F., Thompson, C. B., Sugar, E. A., Yenokyan, G., Janis, S., John, S., Harnof, S., Lopez, G. A., Aldrich, E. F., Harrigan, M. R., Ansari, S., Jallo, J., Caron, J.-L., LeDoux, D., Adeoye, O., Zuccarello, M., Jr. H. P. A., Rosenblum, M., Thompson, R. E., Awad, I. A., CLEAR III Investigators, "Thrombolytic removal of intraventricular haemorrhage in treating severe stroke: results of the CLEAR III trial, a randomised, controlled trial". *The Lancet*, In Press.

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.

Software

R Packages

All download counts are from RStudio CRAN logs and are accurate as of October 04, 2016.

fslr: Wrapper Functions for FSL (FMRIB Software Library) from Functional MRI of the Brain (FMRIB),
Downloads: 8791.

brainR: Helper Functions to Misc3d and rgl Packages for Brain Imaging,
Downloads: 8727.

WhiteStripe: White Matter Normalization for Magnetic Resonance Images using Whitestripe,
Downloads: 4831.

matlabr: An Interface for MATLAB using System Calls,
Downloads: 3069.

diffr: Display Differences Between Two Files using Codediff Library,
Downloads: 1955.

rscopus: Scopus Database API Interface,
Downloads: 1861.

spm12r: Wrapper Functions for SPM (Statistical Parametric Mapping) Version 12 from the Wellcome Trust Centre for Neuroimaging,
Downloads: 1721.

oasis: Multiple Sclerosis Lesion Segmentation using Magnetic Resonance Imaging (MRI),
Downloads: 1379.

papayar: View Medical Research Images using the Papaya JavaScript Library,
Downloads: 594.

freesurfer: Wrapper Functions for Freesurfer,
Downloads: 126.

neurobase: Neuroconductor Base Package with Helper Functions for nifti Objects,
Downloads: 96.

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.

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.

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.

2013–Present **Co-founder, Vanguard Scholarship**, *Sun Valley High School*.
Co-founded a scholarship for outstanding students attending my alma mater, Sun Valley High School. Interviewed students as a representative of a graduate doing science at mock interview day. Continually recruiting other graduates to become involved and fund raising.

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.