Daniel Jon Peterson

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Skills

General: Data analysis pipelines, High performance computing, Statistics, Visualization, Data ethics

Programming languages: bash, R, python, java, MATLAB, Mathematica

Other systems and tools: AWS (S3, EC2, Batch), Docker, github, Jupyter, Terraform

Experience

Research Engineer III **University of Washington** **Apr 2015-Present**

• Created and maintained a variety of data processing pipelines for medical images, and executed them on a high-performance computing cluster.

• Took a lead role in modernizing research group practices to use AWS, github, python and R.

• Worked directly with research subjects and clinical trial participants from challenging populations, such as patients with epilepsy, people with advanced dementia, and people currently in hospice care.

• Extracted biological meaning from diverse data sets using advanced statistics, graph theory, and machine learning techniques, resulting in multiple scientific publications (h-index=9).

Data Engineering Fellow **Insight Data Science** **Sep 2019-Sep 2020**

• Developed a webservice to make it easy for people to get 3D prints of their brain from an MRI.

• Scaled-up and productionized a computationally intensive image processing pipeline, run on AWS Batch, deployed with Terraform, and a frontend made with Flask (python).

• Served public users, and conducted a successful stress-test of many concurrent simulated users.

Research Assistant **The Kennedy Krieger Institute** **Jan 2012-Apr 2015**

• Designed image processing workflows in bash and MATLAB that were used for years afterwards.

• Assisted in writing successful grants to both governmental and private funding sources.

Graduate Research Assistant **Johns Hopkins University** **Aug 2010-Jan 2012**

• Purified isotopically enriched proteins, and performed magnetic resonance experiments.

• Completed advanced coursework in quantum mechanics, and computational chemistry.

Education

BA in Chemistry **Lewis & Clark College, Portland, OR** **May 2006**

Publications

Journal Articles

Mossa-Basha, M., Peterson, D. J., Hippe, D. S., Vranic, J. E., Hofstetter, C., Reyes, M., ... & Jarvik, J. G. (2020). Segmented quantitative diffusion tensor imaging evaluation of acute traumatic cervical spinal cord injury. The British Journal of Radiology, 93, 20201000.

Madhyastha TM, Koh N, McAllister-Day TK, Hernández-Fernández M, Kelley A, Peterson DJ, Rajan S, Woelfer KA, Wolf J, Grabowski TJ. (in press, November 2017) Running neuroimaging applications on Amazon Web Services: How, when, and at what cost?. Frontiers in neuroinformatics.

Peterson D. (2017). Streamlining the process of 3d printing a brain from a structural MRI. Research Ideas and Outcomes, 3, e13394.

Rutman A, Peterson DJ, Cohen WA, Mossa-Basha M. (2017) Diffusion Tensor Imaging of the Spinal Cord: Clinical Value, Investigational Applications, and Technical Limitations. Current Problems in Diagnostic Radiology

Peterson DJ, Rutman A, Hippe DS, Jarvik JG, Chokshi FH, Reyes MR, Bombardier CH, Mossa-Basha M. (2017) Test-Retest and Inter-Reader Reproducibility of Semi-Automated Atlas-Based Analysis of Diffusion Tensor Imaging Data in Acute Cervical Spine Trauma in Adult Patients, American Journal of Neuroradiology. 38 (10), 2015-2020

Wang S, Peterson DJ, Wang Y, Wang Q,Grabowski TJ, Li W, Madhyastha TM. (2017) Empirical Comparison of Diffusion Kurtosis Imaging and Diffusion Basis Spectrum Imaging Using the Same Acquisition in Healthy Young Adults. Frontiers in Neurology. 2017;8:118. doi:10.3389/fneur.2017.00118.

Wang S, Peterson DJ, Gatenby JC, Li W, Grabowski TJ, Madhyastha TM. (2017) Evaluation of Field Map and Nonlinear Registration Methods for Correction of Susceptibility Artifacts in Diffusion MRI. Frontiers in Neuroinformatics. 2017;11:17. doi:10.3389/fninf.2017.00017.

Askren MK, McAllister-Day TK, Koh N, Mestre Z, Dines JN, Korman BA, Melhorn SJ, Peterson DJ, Peverill M, Rane SD, Reilly MA, Reiter MA, Sambrook KA, Woelfer KA, Qin X, Grabowski T, Madhyastha T. (2016) Using Make for Reproducible and Parallel Neuroimaging Workflow and Quality Assurance. Fronteirs in Neuroinformatics, 10(2), 1-16

Jacobson LA, Peterson DJ, Rosch KS, Crocetti D, Mori S, & Mostofsky SH. (2015). Sex-Based Dissociation of White Matter Microstructure in Children With Attention-Deficit/Hyperactivity Disorder.Journal of the American Academy of Child & Adolescent Psychiatry, 54(11), 938-946.

Peterson D*, Mahajan R*, Crocetti D, Mejia A, Mostofsky S. (2015). Left-Hemispheric Microstructural Abnormalities in Children With High-Functioning Autism Spectrum Disorder. Autism Research, 8(1), 61-72. (*equal contribution)

Dancy BM, Crump NT, Peterson DJ, Mukherjee C, Bowers EM, Ahn YH, ... & Cole PA. (2012). Live-Cell Studies of p300/CBP Histone Acetyltransferase Activity and Inhibition. Chembiochem, 13(14), 2113-2121.
→ This article was featured on the cover of the Sep. 2012 issue of Chembiochem

Peterson DJ, Ryan M, Rimrodt SL, Cutting LE, Denckla MB, Kaufmann WE, & Mahone EM. (2011). Increased regional fractional anisotropy in highly screened attention-deficit hyperactivity disorder (ADHD). Journal of child neurology, 26(10), 1296-1302..
→ These findings were presented as part of a lecture at the Johns Hopkins dept. of Neurology grand rounds

Rimrodt SL, Peterson DJ, Denckla MB, Kaufmann WE, & Cutting LE. (2010). White matter microstructural differences linked to left perisylvian language network in children with dyslexia. Cortex, 46(6), 739-749.
→ The results presented here were the subject of a press release issued by the editor of Cortex

Peterson DJ, Loening NM. (2007) QQ-HSQC: a quick, quantitative heteronuclear correlation experiment for NMR spectroscopy. Magn. Reson. Chem. 45(11):937-41.

Conference Proceedings

Daniel Peterson, Jason Webster, Annika Noreen, Frankin Faust, Robin Stillwell, Christina Caso, Kimiko Domoto-Reilly, Kristoffer Rhodes, Carolyn Parsey, Michael Persenaire, Tung Le, Thomas Grabowski. (June 2020) MIND-AD: Multidimensional Imaging and Neurocognitive Dataset for the Assessment of Dementia. Annual Meeting of the Organization for Human Brain Mapping

Domoto-Reilly K, Peterson D, Dutt S, Heuer H, Luong P, Tartaglia C, Litvan I, McGinnis S, Dickerson B, Kornak J, Schuff N, Rabinovici G, Miller B, Fagan A, Kantarci K, Pantelyat A, Foroud T, Boeve B, Rosen H, Boxer A (April 2018) MRI-Derived Markers of Disease Progression in Early Versus Late PSP and CBS. Annual meeting of the American Academy of Neurology in Los Angeles, California

Peterson D, Koh N, Askren M, Gatenby C, Madhyastha T, Grabowski T. (June 2017) Profiles of White Matter Microstructure in a Population- Based Cohort of Elderly Patients. Annual meeting of the Organization for Human Brain Mapping (OHBM) in Vancouver, Canada. https://doi.org/10.6084/m9.figshare.5208082.v1

Peterson D, Wang S, Wang Y, Grabowski T, Li W, Madhyastha T. (June 2017) Comparison of Diffusion Kurtosis Imaging to Diffusion Basis Spectrum Imaging in Healthy Young Adults. Annual meeting of the Organization for Human Brain Mapping (OHBM) in Vancouver, Canada. https://doi.org/10.6084/m9.figshare.5208064.v2

Peterson DJ, Hippe DS, Rutman AM, Wilson AE, Jarvik J, Cohen WA, Chokshi F, Mossa-Basha M. (February 2017) Test-Retest and Inter-Reader Reliability of Semi-Automated Atlas-Based Analysis of Diffusion Tensor Imaging Data in Acute Cervical Spinal Cord Injury in Adult Patients, Annual Symposium of the American Society for Spine Radiology (ASSR) in San Diego, California
→Recognized as Best Paper in the Diagnostic Spine category

Rutman AM, Peterson D, Cohen W, Mossa-Basha M. (December 2015) Diffusion Tensor Imaging of the Spinal Cord. An Educational exhibit presented at the 101st Scientific Assembly and Annual Meeting of the Radiological Society of North America in Chicago, Illinois.
→This exhibit received the Cum Laude award

Peterson D, Jacobson L, Crocetti D, Rosch K, Mostofsky S. (June 2014) Premotor white matter integrity is associated with response control in boys, but not girls with ADHD. Annual meeting of the Organization for Human Brain Mapping (OHBM) in Hamburg, Germany.

Peterson D, Caffo B, Mostofsky S. (June 2013) Anomalous Anatomical Connectivity Networks in Children with Autism Spectrum Disorder. Annual meeting of the Organization for Human Brain Mapping (OHBM) in Hamburg, Germany.

Mahone EM, Peterson D, Crocetti D, Slifer K, Denckla MB, Mostofsky SH. (June 2013) Abnormal White Matter Diffusivity in Preschool-Age Children with ADHD. 4th World Congress on ADHD in Milan, Italy.

Peterson D, Crocetti D, Belkaya N, Mostofsky S. (October 2012) Left-Hemisphere Microstructural Abnormalities in Autism Spectrum Disorder. Annual meeting of the Society For Neuroscience (SFN) in New Orleans, Louisiana.

Peterson D, Ryan M, Richardson M, Rimrodt SL, Cutting LE, Mahone EM. (2009, February) Diffusion Tensor Imaging of Children with Attention-Deficit-Hyperactivity Disorder. Annual meeting of the International Neuropsychological Society, Atlanta, GA.

Peterson DJ, Landman BA, Gaur P, Cutting LE, (2008, May) The Impact of Robust Diffusion Tensor Estimation on Voxel-Wise Analysis of DTI Data. Annual meeting of the International Society for Magnetic Resonance in Medicine, Toronto, ON.

Peterson DJ, Gaur P, Rimrodt S. Cutting LE, Denckla M, (2008, July) Diffusion Tensor Imaging of Children with Reading Disability. Annual meeting of the Society for the Scientific Study of Reading, Asheville, NC

Peterson DJ, Gaur P, Rimrodt SL, Cutting LE. (2008, November) Diffusion Tensor Imaging in children with Neurofibromatosis Type 1 and Reading Disability. Annual meeting of the Child Neurology Society, Santa Clara, CA.

Suskauer SJ, Satorio CF, Peterson DJ, Mostofsky SH, Christensen JR. (2007, November) Neuroanatomical and Neurocognitive Differences in a Pair of Twins Concordant for Traumatic Brain Injury. New Frontiers in Pediatric Traumatic Brain Injury Conference, San Diego, CA.

Peterson DJ, Loening NM. (2006, April) QQ-HSQC: A Quick Quantitative Heteronuclear Correlation Experiment. Experimental Nuclear Magnetic Resonance Conference, Pacific Grove, CA