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Nick Tustison

Curriculum Vitae

Education

2004 **D.Sc. Biomedical Engineering**, *Washington University in St. Louis*, St. Louis, MO.
Thesis: *Biventricular Myocardial Strains With Anatomical NURBS Models From Tagged MRI*

2000 **M.S. Biomedical Engineering**, *University of Virginia*, Charlottesville, VA.
Thesis: *Quantification Methods for Assessing Asthma in Hyperpolarized 3He Lung MRI Studies*

1998 **B.S. Applied Physics: Computer Science**, *Brigham Young University*, Provo, UT.

Professional Appointments

2017– **Associate Professor**, *Department of Radiology and Medical Imaging*, University of Virginia, Charlottesville, VA.

2018– **Visiting Associate Researcher**, *Department of Neurobiology and Behavior*, University of California, Irvine, Irvine, CA.

2010–2017 **Assistant Professor**, *Department of Radiology and Medical Imaging*, University of Virginia, Charlottesville, VA.

2016–2018 **Visiting Assistant Researcher**, *Department of Neurobiology and Behavior*, University of California, Irvine, Irvine, CA.

2005–2010 **Senior Research Investigator**, *Department of Radiology*, University of Pennsylvania, Philadelphia, PA.

2004–2005 **Research Fellow**, *Department of Radiology*, University of Pennsylvania, Philadelphia, PA.

Academic Service

Program committees

2012–present **SPIE Medical Imaging**.

Editorships

2012–present **Frontiers Review Editorial Board**.

May 2013– **Frontiers in Neuroinformatics: Guest Editor**, *Neuroinformatics with the Insight ToolKit*.

Reviewer Duties

Academic Radiology
American Journal of Neuroradiology
Annals of Biomedical Engineering
Artificial Intelligence in Medicine
Biomedical Signal Processing and Control
Computer Vision and Image Understanding
Computers in Biology and Medicine
Computerized Medical Imaging and Graphics
Focused Ultrasound Foundation ad hoc grant reviewer
Human Brain Mapping
Image and Vision Computing
International Journal of Pattern Recognition and Artificial Intelligence
IEEE Transactions on Cybernetics
IEEE Transactions on Medical Imaging
IEEE Transactions on Pattern Analysis and Machine Intelligence
IEEE Transactions on Biomedical Engineering
Insight Journal
International Conf. on Medical Image Computing and Computer Assisted Intervention
International Journal of Biomedical Imaging
International Journal of Computer Vision
International Workshop on Medical Imaging and Augmented Reality
IEEE International Symposium on Biomedical Imaging: From Nano to Macro
Journal of Computed Tomography
Journal of Electronic Imaging
Journal of Magnetic Resonance Imaging
Journal of Neurotrauma
Journal of the Optical Society of America A
Magnetic Resonance in Medicine
Medical Physics
Medical Image Analysis
Neurobiology of Aging
NeuroImage
NeuroImage: Clinical
Neuroradiology
Neuroscience and Biobehavioral Reviews
PLOS ONE
Psychiatric Research: Neuroimaging
Respirology
SIAM Journal on Imaging Sciences

Invited Talks/Participation

Feb 2012 **SPIE conference**, *Open source tools for medical image analysis*.

Sept 2012 **MICCAI**, *provided canonical registrations for Grand Challenge and Workshop on Multi-Atlas Labeling*.

Sept 2013 **MICCAI**, *provided canonical registrations for SATA challenge workshop*.

May 2015 **CREATE-MIA**, *ANTs Workshop*.

Oct 2015 **MICCAI**, *SimpleITK tutorial*.

Computer Skills

Languages C++, perl, bash, LaTeX, R

Tools and Libraries Advanced Normalization Tools (ANTs), Insight Toolkit (ITK), Visualization Toolkit (VTK), Paraview, git, Matlab, PBS/SGE qsub

Awards

2010 **1st place**, *EMPIRE10 lung registration competition*, MICCAI Conference 2010.

2013 **1st place**, *BRATS2013 multimodal brain tumor segmentation competition*, MICCAI Conference 2013.

2014 **Best paper award**, *STACOM2014 cardiac motion estimation challenge*, MICCAI Conference 2014.

Publications

Articles

G Allan Johnson, Nian Wang, Robert J Anderson, Min Chen, Gary P Cofer, James C Gee, Forrest Pratson, Nicholas Tustison, and Leonard E White. Whole mouse brain connectomics. *J Comp Neurol*, Oct 2018.

Neha Sinha, Zachariah M Reagh, Nicholas J Tustison, Chelsie N Berg, Ashlee Shaw, Catherine E Myers, Diane Hill, Michael A Yassa, and Mark A Gluck. Abca7 risk variant in healthy older african americans is associated with a functionally isolated entorhinal cortex mediating deficient generalization of prior discrimination training. *Hippocampus*, Oct 2018.

Neha Sinha, Chelsie N Berg, Nicholas J Tustison, Ashlee Shaw, Diane Hill, Michael A Yassa, and Mark A Gluck. Apoe Îţ4 status in healthy older african americans is associated with deficits in pattern separation and hippocampal hyperactivation. *Neurobiol Aging*, 69:221–229, Sep 2018.

Nicholas J Tustison, Brian B Avants, Zixuan Lin, Xue Feng, Nicholas Cullen, Jaime F Mata, Lucia Flors, James C Gee, Talissa A Altes, John P Mugler Iii, and Kun Qing. Convolutional neural networks with template-based data augmentation for functional lung image quantification. *Acad Radiol*, Sep 2018.

Kun Qing, Nicholas J Tustison, John P Mugler, 3rd, Jaime F Mata, Zixuan Lin, Li Zhao, Da Wang, Xue Feng, Ji Young Shin, Sean J Callahan, Michael P Bergman, Kai Ruppert, Talissa A Altes, Joanne M Cassani, and Y Michael Shim. Probing changes in lung physiology in copd using ct, perfusion mri, and hyperpolarized xenon-129 mri. *Acad Radiol*, Aug 2018.

Yi Xin, Maurizio Cereda, Hooman Hamedani, Mehrdad Pourfathi, Sarmad Siddiqui, Natalie Meeder, Stephen Kadlecek, Ian Duncan, Harrilla Profka, Jennia Rajaei, Nicholas J Tustison, James C Gee, Brian P Kavanagh, and Rahim R Rizi. Unstable inflation causing injury. insight from prone position and paired computed tomography scans. *Am J Respir Crit Care Med*, 198(2):197–207, Jul 2018.

Sandhitsu R Das, Long Xie, Laura E M Wisse, Ranjit Ittyerah, Nicholas J Tustison, Bradford C Dickerson, Paul A Yushkevich, David A Wolk, and Alzheimer's Disease Neuroimaging Initiative. Longitudinal and cross-sectional structural magnetic resonance imaging correlates of av-1451 uptake. *Neurobiol Aging*, 66:49–58, Jun 2018.

Eduardo J Mortani Barbosa, Jr, Haochang Shou, Scott Simpsom, James Gee, Nicholas Tustison, and James C Lee. Quantitative computed tomography metrics from the transplanted lung can predict forced expiratory volume in the first second after lung transplantation. *J Thorac Imaging*, 33(2):112–123, Mar 2018.

Zachariah M Reagh, Jessica A Noche, Nicholas J Tustison, Derek Delisle, Elizabeth A Murray, and Michael A Yassa. Functional imbalance of anterolateral entorhinal cortex and hippocampal dentate/ca3 underlies age-related object pattern separation deficits. *Neuron*, 97(5):1187–1198.e4, Mar 2018.

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Yi Xin, Maurizio Cereda, Hooman Hamedani, Mehrdad Pourfathi, Sarmad Siddiqui, Natalie Meeder, Stephen Kadlecek, Ian Duncan, Harrilla Profka, Jennia Rajaei, Nicholas J Tustison, James C Gee, Brian P Kavanagh, and Rahim R Rizi. Unstable inflation causing injury: Insight from prone position and paired ct scans. *Am J Respir Crit Care Med*, Feb 2018.

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Andrew T Grainger, Nicholas J Tustison, Kun Qing, Rene Roy, Stuart S Berr, and Weibin Shi. Deep learning-based quantification of abdominal fat on magnetic resonance images. *PLoS One*, 13(9):e0204071, 2018.

Maurizio Cereda, Yi Xin, Hooman Hamedani, Giacomo Bellani, Stephen Kadlecek, Justin Clapp, Luca Guerra, Natalie Meeder, Jennia Rajaei, Nicholas J Tustison, James C Gee, Brian P Kavanagh, and Rahim R Rizi. Tidal changes on CT and progression of ARDS. *Thorax*, 72(11):981–989, Nov 2017.

A Murat Maga, Nicholas J Tustison, and Brian B Avants. A population level atlas of mus musculus craniofacial skeleton and automated image-based shape analysis. *J Anat*, 231(3):433–443, Sep 2017.

Beau Pontre, Brett R Cowan, Edward DiBella, Sancgeetha Kulaseharan, Devavrat Likhite, Nils Noorman, Lennart Tautz, Nicholas Tustison, Gert Wollny, Alistair A Young, and Avan Suinesiaputra. An open benchmark challenge for motion correction of myocardial perfusion mri. *IEEE J Biomed Health Inform*, 21(5):1315–1326, Sep 2017.

E Mortani Barbosa, Jr, S Simpson, J C Lee, N Tustison, J Gee, and H Shou. Multivariate modeling using quantitative CT metrics may improve accuracy of diagnosis of bronchiolitis obliterans syndrome after lung transplantation. *Comput Biol Med*, 89:275–281, Aug 2017.

Amy C Ladd, David G Brohawn, Ravindar R Thomas, Paula M Keeney, Stuart S Berr, Shaharyar M Khan, Francisco R Portell, Meiram Zh Shakenov, Patrick F Antkowiak, Bijoy Kundu, Nicholas Tustison, and James P Bennett. RNA-seq analyses reveal that cervical spinal cords and anterior motor neurons from amyotrophic lateral sclerosis subjects show

reduced expression of mitochondrial DNA-encoded respiratory genes, and rhTFAM may correct this respiratory deficiency. *Brain Res*, 1667:74–83, Jul 2017.

Talissa A Altes, Mac Johnson, Meredith Fidler, Martyn Botfield, Nicholas J Tustison, Carlos Leiva-Salinas, Eduard E de Lange, Deborah Froh, and John P Mugler, 3rd. Use of hyperpolarized helium-3 mri to assess response to ivacaftor treatment in patients with cystic fibrosis. *J Cyst Fibros*, 16(2):267–274, Mar 2017.

Talissa A Altes, Mac Johnson, Meredith Fidler, Martyn Botfield, Nicholas J Tustison, Carlos Leiva-Salinas, Eduard E de Lange, Deborah Froh, and John P Mugler, 3rd. Use of hyperpolarized helium-3 MRI to assess response to ivacaftor treatment in patients with cystic fibrosis. *J Cyst Fibros*, 16(2):267–274, Mar 2017.

E Mortani Barbosa, Jr, S Simpson, J C Lee, N Tustison, J Gee, and H Shou. Multivariate modeling using quantitative ct metrics may improve accuracy of diagnosis of bronchiolitis obliterans syndrome after lung transplantation. *Comput Biol Med*, 89:275–281, 10 2017.

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Shengwen Guo, Chunren Lai, Congling Wu, Guiyin Cen, and Alzheimer's Disease Neuroimaging Initiative. Conversion discriminative analysis on mild cognitive impairment using multiple cortical features from mr images. *Front Aging Neurosci*, 9:146, 2017.

Amy C Ladd, David G Brohawn, Ravindar R Thomas, Paula M Keeney, Stuart S Berr, Shaharyar M Khan, Francisco R Portell, Meiram Zh Shakenov, Patrick F Antkowiak, Bijoy Kundu, Nicholas Tustison, and James P Bennett. Rna-seq analyses reveal that cervical spinal cords and anterior motor neurons from amyotrophic lateral sclerosis subjects show reduced expression of mitochondrial dna-encoded respiratory genes, and rhtfam may correct this respiratory deficiency. *Brain Res*, 1667:74–83, 07 2017.

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Lucia Flors, John P Mugler, 3rd, Eduard E de Lange, Grady W Miller, Jaime F Mata, Nick Tustison, Iulian C Ruset, F William Hersman, and Talissa A Altes. Hyperpolarized gas magnetic resonance lung imaging in children and young adults. *J Thorac Imaging*, 31(5):285–95, Sep 2016.

Nicholas J Tustison, Kun Qing, Chengbo Wang, Talissa A Altes, and John P Mugler, 3rd. Atlas-based estimation of lung and lobar anatomy in proton MRI. *Magn Reson Med*, 76(1):315–20, Jul 2016.

Genevera I Allen, Nicola Amoroso, Catalina Anghel, Venkat Balagurusamy, Christopher J Bare, Derek Beaton, Roberto Bellotti, David A Bennett, Kevin L Boehme, Paul C Boutros, Laura Caberlotto, Cristian Caloian, Frederick Campbell, Elias Chaibub Neto, Yu-Chuan Chang, Beibei Chen, Chien-Yu Chen, Ting-Ying Chien, Tim Clark, Sudeshna Das, Christos Davatzikos, Jieyao Deng, Donna Dillenberger, Richard J B Dobson, Qilin Dong, Jimit Doshi, Denise Duma, Rosangela Errico, Guray Erus, Evan Everett, David W Fardo, Stephen H

Friend, Holger Fröhlich, Jessica Gan, Peter St George-Hyslop, Satrajit S Ghosh, Enrico Glaab, Robert C Green, Yuanfang Guan, Ming-Yi Hong, Chao Huang, Jinseub Hwang, Joseph Ibrahim, Paolo Inglese, Anandhi Iyappan, Qijia Jiang, Yuriko Katsumata, John S K Kauwe, Arno Klein, Dehan Kong, Roland Krause, Emilie Lalonde, Mario Lauria, Eunjee Lee, Xihui Lin, Zhandong Liu, Julie Livingstone, Benjamin A Logsdon, Simon Lovestone, Tsung-Wei Ma, Ashutosh Malhotra, Lara M Mangravite, Taylor J Maxwell, Emily Merrill, John Nagorski, Aishwarya Namasivayam, Manjari Narayan, Mufassra Naz, Stephen J Newhouse, Thea C Norman, Ramil N Nurtdinov, Yen-Jen Oyang, Yudi Pawitan, Shengwen Peng, Mette A Peters, Stephen R Piccolo, Paurush Praveen, Corrado Priami, Veronica Y Sabelnykova, Philipp Senger, Xia Shen, Andrew Simmons, Aristeidis Sotiras, Gustavo Stolovitzky, Sabina Tangaro, Andrea Tateo, Yi-An Tung, Nicholas J Tustison, Erdem Varol, George Vradenburg, Michael W Weiner, Guanghua Xiao, Lei Xie, Yang Xie, Jia Xu, Hojin Yang, Xiaowei Zhan, Yunyun Zhou, Fan Zhu, Hongtu Zhu, Shanfeng Zhu, and Alzheimer's Disease Neuroimaging Initiative. Crowdsourced estimation of cognitive decline and resilience in Alzheimer's disease. *Alzheimers Dement*, 12(6):645–53, Jun 2016.

Khader M Hasan, Benson Mwangi, Bo Cao, Zafer Keser, Nicholas J Tustison, Peter Kochunov, Richard E Frye, Mirjana Savatic, and Jair Soares. Entorhinal cortex thickness across the human lifespan. *J Neuroimaging*, 26(3):278–82, May 2016.

Dorian Pustina, H Branch Coslett, Peter E Turkeltaub, Nicholas Tustison, Myrna F Schwartz, and Brian Avants. Automated segmentation of chronic stroke lesions using linda: Lesion identification with neighborhood data analysis. *Hum Brain Mapp*, 37(4):1405–21, Apr 2016.

Talissa A Altes, John P Mugler, 3rd, Kai Ruppert, Nicholas J Tustison, Joanne Gersbach, Sylvia Szentpetery, Craig H Meyer, Eduard E de Lange, and W Gerald Teague. Clinical correlates of lung ventilation defects in asthmatic children. *J Allergy Clin Immunol*, 137(3):789–96.e7, Mar 2016.

Dorian Pustina, H Branch Coslett, Peter E Turkeltaub, Nicholas Tustison, Myrna F Schwartz, and Brian Avants. Automated segmentation of chronic stroke lesions using LINDA: Lesion identification with neighborhood data analysis. *Hum Brain Mapp*, Jan 2016.

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Jia Xu, Hojin Yang, Xiaowei Zhan, Yunyun Zhou, Fan Zhu, Hongtu Zhu, Shanfeng Zhu, and Alzheimer's Disease Neuroimaging Initiative. Crowdsourced estimation of cognitive decline and resilience in alzheimer's disease. *Alzheimers Dement*, 12(6):645–53, 06 2016.

Anthony J Filiano, Yang Xu, Nicholas J Tustison, Rachel L Marsh, Wendy Baker, Igor Smirnov, Christopher C Overall, Sachin P Gadani, Stephen D Turner, Zhiping Weng, Sayeda Najamussahar Peerzade, Hao Chen, Kevin S Lee, Michael M Scott, Mark P Beenhakker, Vladimir Litvak, and Jonathan Kipnis. Unexpected role of interferon-Îş in regulating neuronal connectivity and social behaviour. *Nature*, 535(7612):425–9, 07 2016.

Anthony J Filiano, Yang Xu, Nicholas J Tustison, Rachel L Marsh, Wendy Baker, Igor Smirnov, Christopher C Overall, Sachin P Gadani, Stephen D Turner, Zhiping Weng, Sayeda Najamussahar Peerzade, Hao Chen, Kevin S Lee, Michael M Scott, Mark P Beenhakker, Vladimir Litvak, and Jonathan Kipnis. Unexpected role of interferon-γ in regulating neuronal connectivity and social behaviour. *Nature*, 535(7612):425–9, 07 2016.

Khader M Hasan, Benson Mwangi, Bo Cao, Zafer Keser, Nicholas J Tustison, Peter Kochunov, Richard E Frye, Mirjana Savatic, and Jair Soares. Entorhinal cortex thickness across the human lifespan. *J Neuroimaging*, 26(3):278–82, 05 2016.

James R Stone, Elisabeth A Wilde, Brian A Taylor, David F Tate, Harvey Levin, Erin D Bigler, Randall S Scheibel, Mary R Newsome, Andrew R Mayer, Tracy Abildskov, Garrett M Black, Michael J Lennon, Gerald E York, Rajan Agarwal, Jorge DeVillasante, John L Ritter, Peter B Walker, Stephen T Ahlers, and Nicholas J Tustison. Supervised learning technique for the automated identification of white matter hyperintensities in traumatic brain injury. *Brain Inj*, 30(12):1458–1468, 2016.

Nicholas J Tustison, Kun Qing, Chengbo Wang, Talissa A Altes, and John P Mugler, 3rd. Atlas-based estimation of lung and lobar anatomy in proton mri. *Magn Reson Med*, 76(1):315–20, 07 2016.

Elisabeth A Wilde, Erin D Bigler, Trevor Huff, Haonan Wang, Garrett M Black, Zachary P Christensen, Naomi Goodrich-Hunsaker, Jo Ann Petrie, Tracy Abildskov, Brian A Taylor, James R Stone, Nicholas J Tustison, Mary R Newsome, Harvey S Levin, Zili D Chu, Gerald E York, and David F Tate. Quantitative structural neuroimaging of mild traumatic brain injury in the chronic effects of neurotrauma consortium (cenc): Comparison of volumetric data within and across scanners. *Brain Inj*, 30(12):1442–1451, 2016.

Elisabeth A Wilde, Erin D Bigler, Trevor Huff, Haonan Wang, Garrett M Black, Zachary P Christensen, Naomi Goodrich-Hunsaker, Jo Ann Petrie, Tracy Abildskov, Brian A Taylor, James R Stone, Nicholas J Tustison, Mary R Newsome, Harvey S Levin, Zili D Chu, Gerald E York, and David F Tate. Quantitative structural neuroimaging of mild traumatic brain injury in the Chronic Effects of Neurotrauma Consortium (CENC): Comparison of volumetric data within and across scanners. *Brain Inj*, 30(12):1442–1451, 2016.

Talissa A Altes, John P Mugler, 3rd, Kai Ruppert, Nicholas J Tustison, Joanne Gersbach, Sylvia Szentpetery, Craig H Meyer, Eduard E de Lange, and W Gerald Teague. Clinical correlates of lung ventilation defects in asthmatic children. *J Allergy Clin Immunol*, Oct 2015.

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Bjoern H Menze, Andras Jakab, Stefan Bauer, Jayashree Kalpathy-Cramer, Keyvan Farahani, Justin Kirby, Yuliya Burren, Nicole Porz, Johannes Slotboom, Roland Wiest, Levente Lanczi, Elizabeth Gerstner, Marc-André Weber, Tal Arbel, Brian B Avants, Nicholas Ayache, Patricia Buendia, D Louis Collins, Nicolas Cordier, Jason J Corso, Antonio Criminisi, Tilak Das, Hervé Delingette, Çağatay Demiralp, Christopher R Durst, Michel Dojat, Senan Doyle, Joana Festa, Florence Forbes, Ezequiel Geremia, Ben Glocker, Polina Golland, Xiaotao Guo, Andac Hamamci, Khan M Iftekharuddin, Raj Jena, Nigel M John, Ender Konukoglu, Danial Lashkari, José Antonió Mariz, Raphael Meier, Sérgio Pereira, Doina Precup, Stephen J Price, Tammy Riklin Raviv, Syed M S Reza, Michael Ryan, Duygu Sarikaya, Lawrence Schwartz, Hoo-Chang Shin, Jamie Shotton, Carlos A Silva, Nuno Sousa, Nagesh K Subbanna, Gabor Szekely, Thomas J Taylor, Owen M Thomas, Nicholas J Tustison, Gozde Unal, Flor Vasseur, Max Wintermark, Dong Hye Ye, Liang Zhao, Binsheng Zhao, Darko Zikic, Marcel Prastawa, Mauricio Reyes, and Koen Van Leemput. The multimodal brain tumor image segmentation benchmark (brats). *IEEE Trans Med Imaging*, 34(10):1993–2024, Oct 2015.

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Nicholas J Tustison, Kun Qing, Chengbo Wang, Talissa A Altes, and John P Mugler, 3rd. Atlas-based estimation of lung and lobar anatomy in proton MRI. *Magn Reson Med*, Jul 2015.

Christopher R Durst, Navin Michael, Nicholas J Tustison, James T Patrie, Prashant Raghavan, Max Wintermark, and S Sendhil Velan. Noninvasive evaluation of the regional variations of GABA using magnetic resonance spectroscopy at 3 Tesla. *Magn Reson Imaging*, 33(5):611–7, Jun 2015.

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Brian B Avants, Jeffrey T Duda, Emily Kilroy, Kate Krasileva, Kay Jann, Benjamin T Kandel, Nicholas J Tustison, Lirong Yan, Mayank Jog, Robert Smith, Yi Wang, Mirella Dapretto, and Danny J J Wang. The pediatric template of brain perfusion. *Sci Data*, 2:150003, 2015.

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Nicholas Said, W Jeff Elias, Prashant Raghavan, Alan Cupino, Nicholas Tustison, Robert Frysinger, James Patrie, Wenjun Xin, and Max Wintermark. Correlation of diffusion tensor tractography and intraoperative macrostimulation during deep brain stimulation for parkinson disease. *J Neurosurg*, 121(4):929–35, Oct 2014.

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