# CURRICULUM VITAE

**Nicholas J. Tustison**

1. **PERSONAL DATA**

Nicholas J. Tustison, DSc

Professor

Department of Radiology and Medical Imaging

University of Virginia

ntustison@virginia.edu

1. **EDUCATION**

D.Sc. Biomedical Engineering Washington University in St. Louis 2004

M.S. Biomedical Engineering University of Virginia 2000

B.S. Applied Physics:

Computer Science emphasis Brigham Young University 1998

1. **POST-GRADUATE EDUCATION**

Post-doctoral fellowship University of Pennsylvania 2005

1. **ACADEMIC APPOINTMENTS**

Professor University of Virginia 2024-

Visiting Associate Researcher University of California, Irvine 2017-

Associate Professor University of Virginia 2017-2024

Visiting Assistant Researcher University of California, Irvine 2016-2017

Assistant Professor University of Virginia 2010-2017

1. **OTHER EMPLOYMENT PERTAINING TO CURRENT PROFESSIONAL APPOINTMENTS**

Staff Scientist University of Pennsylvania 2006-2010

1. **CERTIFICATION AND LICENSURE**

# Certification

# N/A

# Licensure

# N/A

1. **HONORS AND AWARDS**

N/A

1. **PROFESSIONAL AFFILIATIONS (INCLUDING LEADERSHIP POSITIONS HELD)**

N/A

1. **RESEARCH ACTIVITIES**
   1. **Areas of Research Interest**

I am a scientist specializing in medical image analysis with technical expertise in and international recognition for the development of high-quality, open-source computational strategies for large-scale medical and biological research targeting neuroscience, pulmonary, and small animal research applications.

* 1. **Current Projects**

**ANTsX Ecosystem Development (including deep learning)**

I am one of the co-founders and main developers of the Advanced Normalization Tools Ecosystem (ANTsX)---a state-of-the-art, open-source library of software tools for image registration, segmentation, and other quantitative medical imaging functionality. Over the course of its development, ANTsX has enabled hundreds of academic and industrial scientists to meet modern quantitative imaging needs with particular focus on issues in biomedical imaging. A broad range of ANTsX-based applications and published research sample the study of organisms from small animals to humans as well as target organ systems such as respiratory, cardiovascular, and nervous. This toolkit is used widely by multiple universities (e.g., Stanford University, Harvard University, University of California, Los Angeles), businesses (e.g., General Electric Research and Konica Minolta), and research institutions (e.g., the Child Mind Institute and the Allen Institute for Brain Science) around the world.

Over the course of its development, ANTsX has been extended to complementary frameworks resulting in the Python- and R-based ANTsPy and ANTsR toolkits, respectively. These packages interface with extremely popular, high-level, open-source programming platforms which have significantly increased the user base of ANTs. The rapidly rising popularity of deep learning motivated further recent enhancement of ANTs and its extensions, specifically ANTsRNet and ANTsPyNet, dynamic Keras/TensorFlow-based library of popular deep learning architectures and applications specifically geared towards medical imaging.

ANTsX tools are described by some of the most highly cited publications in the field:

* Tustison et al., ANTsX neuroimaging-derived structural phenotypes of UK Biobank. *Scientific Reports*. 14(1):8848, Apr 2024.
* Tustison et al., The ANTsX ecosystem for quantitative biological and medical imaging. *Sci Rep*. 11(1):9068, Apr 2021.
* Tustison et al., Large-Scale Evaluation of ANTs and FreeSurfer Cortical Thickness Measurements. *Neuroimage*, 99:166-179, Oct 2014.
* Tustison et al., A Reproducible Evaluation of ANTs Similarity Metric Performance in Brain Image Registration. *Neuroimage*, 54(3):2033–2044, February 2011.
* Tustison et al., N4ITK: Improved N3 Bias Correction. *IEEE Trans Med Imaging*, 29(6):1310–1320, June 2010.

**Traumatic Brain Injury**

With principal UVa collaborators James Stone and Brian Avants, we are engaged in ongoing research investigating chronic neurological changes in individuals repeatedly exposed to low-intensity blasts. We have made major contributions to the community in the form of statistical methods and analysis of neuroimaging sequelae:

* Allyson T. Gage, James R. Stone, Elisabeth A. Wilde, Stephen R. McCauley, Robert C. Welsh, John P. Mugler, III, **Nick Tustison**, Brian Avants, Christopher T. Whitlow, Lee Lancashire, Seema D. Bhatt, and Magali Haas. Normative Neuroimaging Library: Designing a Comprehensive and Demographically Diverse Dataset of Healthy Controls to Support Traumatic Brain Injury Diagnostic and Therapeutic Development. *J Neurotrauma*. 41(23-24):2497-2512, Dec 2024.
* James R. Stone, Brian B. Avants, **Nicholas Tustison**, Jessica Gill, Elisabeth A. Wilde, George E. Wahlen, Kiel D. Neumann, Leslie A. Gladney, Madison O. Kilgore, F. Bowling, Christopher M. Wilson, John F. Detro, Heather G. Belanger, Katryna Deary, Hans Linsenbardt, and Stephen T. Ahlers. Neurological effects of repeated blast exposure in Special Operations personnel. *Journal of Neurotrauma*.  *Journal of Neurotrauma*. 41(7-8):942-956, Apr 2024.
* Brian B. Avants, Nicholas J. Tustison, and James R. Stone. Interpretable, similarity-driven multi-view embeddings from high-dimensional biomedical data.  *Nat Comput Sci*, 1(2):143-152, Feb 2021.
* James Stone, Brian Avants, **Nicholas Tustison**, Eric Wasserman, Jessica Gill, Elena Polejaeva, Kristine Dell, Walter Carr, Angela Yarnell, Matthew LoPresti, Peter Walker, Meghan O’Brien, Natalie Domeisen, Alycia Quick, Claire Modica, John D. Hughes, Francis Haran, Carl Goforth, and Stephen Ahlers. Functional and structural neuroimaging correlates of repetitive low-level blast exposure in career breachers.  *J Neurotrauma*, 37(23):2468-2481, Dec 2020.

**Hyperpolarized gas imaging quantification**

UVa is internationally recognized for its innovation in functional lung imaging using hyperpolarized gas. I provide algorithmic innovation for image quantitation. This work is also publicly available as open-source and has been recently leveraged for use as a research community resource at ([www.xenonanalysis.com](http://www.xenonanalysis.com)). Major publications include:

* Tustison et al.**,** Image-versus histogram-based considerations in semantic segmentation of pulmonary hyperpolarized gas images.  *Magn Reson Med*, 86(5):2822-2836, Nov 2021.
* Tustison et al, Convolutional Neural Networks with Template-Based Data Augmentation for Functional Lung Image Quantification.  *Acad Radiol*, 26(3):412-423, Mar 2019.
* Tustison et al.**,** *J Magn Reson Imaging*, 34(4):831–841, October 2011.
* Tustison et al.**,** Feature Analysis of Hyperpolarized Helium-3 Pulmonary MRI: A Study of Asthmatics versus Non-Asthmatics. *Magn Reson Med*, 63(6):1448–1455, June 2010.
  1. **Research Collaborations/Team Science**

As my scientific contributions involve algorithmic development and open-source tools for medical image analysis, much of my research is collaborative and team science-oriented. My collaborations typically involve a consulting and/or mentoring as illustrated by the numerous publications and grants listed. I have also provided collaborative services such as providing evaluative comparison data for international competitions using ANTs software:

* Generated comparative mappings for the MICCAI BraTS-Reg challenge (2022).
* Provided canonical label mappings for the MICCAI [Grand Challenge and Workshop on Multi-Atlas Labeling](https://masi.vuse.vanderbilt.edu/workshop2012/index.php/Main_Page) (2013).
* Produced canonical normalizations for the MICCAI [SATA challenge workshop](https://masi.vuse.vanderbilt.edu/workshop2013/index.php/Program_and_Proceedings) (2012).

1. **TEACHING ACTIVITIES**

**ANTsX tutorials and online support**

As one of the primary developers of the Advanced Normalization Tools, I provide online support, assistance, and online workable examples for our large user base. I also provide on-site and remote tutorials (cf. Section XIII).

**Individual mentoring and instruction**

I work with many students and post-docs of collaborators providing instruction and guidance for their research projects as it pertains to imaging. Specific mentoring relationships and outcomes are listed in Section XVII.

1. **TEACHING ACTIVITIES OTHER THAN CLASSROOM OR CLINICAL, INCLUDING TEACHING OF UNDERGRADUATE (PRE-BACCALAUREATE), GRADUATE, POSTDOCTORAL STUDENTS AND CONTINUING EDUCATION MEDICAL STUDENTS.**

# Conferences, Grand Rounds, Journal Clubs, etc.

N/A

# Teaching Committees

N/A

* 1. **Learner Counseling**

N/A

* 1. **Formal Study to Improve Teaching Abilities**

N/A

* 1. **Current Research Concerning Teaching**

N/A

* 1. **Bibliography Concerning Teaching**

N/A

* 1. **Other, including development of curriculum or new teaching materials, methods of assessments, program supervision, etc.**

N/A

1. **OTHER PROFESSIONAL ACTIVITIES (BOARDS, EDITORSHIPS, ETC.)**

**Insight Software Consortium Council** 2018-

I currently serve on the board of the Insight Software Consortium. This body determines policy and direction of the Insight Toolkit.

**Frontiers Topic Editor: *Neuroinformatics with the Insight Toolkit*** 2014-2015

With co-editors Brian Avants and Hans Johnson, we organized a special issue of Frontiers: Neuroinformatics to feature recent contributions to the Insight Toolkit including our own image registration refactoring.

**SPIE Medical Imaging Conference Program Committee** 2012-2023

I participated in paper review and acceptance processes as well as speaker selection. I was also responsible for conducting conference sessions.

**Developer, Insight Toolkit, National Library of Medicine** 2008-

I am one of the top contributors to the Insight Toolkit of the National Library of Medicine under the National Institute of Health where I have made software contributions for image registration, segmentation, visualization, and other processing components.

**Manuscript reviews**

I frequently review for high impact journals and conferences (average >1 per month)**.** These include the following:

* Academic Radiology
* American Journal of Neuroradiology
* Annals of Biomedical Engineering
* Artificial Intelligence in Medicine
* Biomedical Signal Processing and Control
* Computers in Biology and Medicine
* Computerized Medical Imaging and Graphics
* 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
* 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
* 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
* PLOS ONE
* Respirology
* SIAM Journal on Imaging Sciences

1. **CLINICAL ACTIVITIES**

# Inpatient

N/A

* 1. **Outpatient**

N/A

* 1. **Clinical Productivity Summary**

N/A

1. **SCHOOL, UNIVERSITY, UVA HOSPITALS, DEPARTMENTS, NATIONAL, AND STATE COMMITTEES & COUNCILS**

# School of Medicine

# N/A

* 1. **University**

# N/A

* 1. **UVA Hospitals**

# N/A

* 1. **Department**

# N/A

* 1. **National**

# N/A

* 1. **State**

# N/A

1. **FINANCIAL RESOURCES (GRANTS AND CONTRACTS)**

# Federal

***i. Current***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Role | Title | Source | Dating | Effort | Total Amount |
| Co-I | Sexual dimorphism in susceptibility to emphysematous tissue injury | NIH | 7/1/2023-6/30/2027 | 7.5% | $3,258,780 |
| Co-I | Dissolved Phase Hyperpolarized Xenon-129 MRI: a novel biomarker to quantify pulmonary pathology in young healthy e-cigarette users | NIH | 9/1/2023-8/1/2028 | 3.5% | $3,710,218 |
| Co-I | Elucidating the role of increased neuroinflammation and related structural and functional neurological sequelae after exposure to repetitive blast | CDMRP | 9/30/2022-9/29/2026 | 5% | $3,439,766 |
| Co-I | Developing Hyperpolarized Gas MRI signatures to detect and manage acute cellular rejection | NIH | 4/1/2024-3/1/2029 | 4.2% | $3,655,531 |
| Co-I | Sexual dimorphism in susceptibility to emphysematous tissue injury | NIH | 06/2023 - 05/2027 | 7.5% | $2,945,238 |
| Site PI | Advanced Normalization Tools | NIH/Univ. of Pennsylvania | 9/30/2022-6/30/2027 | 31.67% | $554,742 |
| Co-I | Interpretable, subject specific-mapping of neurological health in the performance setting | DOD/ONR | 4/1/2023-9/31/2025 | 15% | $537,190 |
| Co-I | Personalized Profiles of Pathology in Pediatric Traumatic Brain Injury | NIH/Univ. of Utah | 1/1/2022-9/30/2025 | 4.5% | $273,627 |
| Co-I | Hyperpolarized 129Xe MRI Ventilation Imaging for the Evaluation of Treatment Response Comparing Three Different Bronchodilator Aerosol Delivery Methods in Patients with COPD: A Pilot Study | Polarean, Inc. | 10/1/2023-10/1/2028 | 1% | $75,240 |

***ii. Pending***

***iii. Completed***

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Site-PI | | ITK-Lung: A Software Framework for Lung Image Processing and Analysis | NIH/Univ. of Penn | 6/1/2017-5/31/2021 | | 53.3% | | $576,069 |
| Co-I | Methods for integrative analysis of modern data sources to advance understanding of Alzheimer’s Disease | | NIH/Univ. of Pennsylvania | | 2/15/2022-1/31/2024 | | 5% | $43,513 |
| Co-I | | Pilot Study to Determine Health Effects of e-cigarette in Healthy Young Adults | NIH | 8/20/2020-1/30/2024 | | 3% | | $829,856 |
| Co-I | | Advanced Neuroimaging Analyses for LIMBIC-CENC | Veterans Health Admin/Univ. of Utah | 3/22/2023-3/21/2024 | | 16.7% | | $271,590 |

# State

N/A

* 1. **Other**

N/A

1. **PHYSICAL FACILITIES**

# N/A

1. **PERSONNEL CURRENTLY SUPERVISED**

In addition to serving on doctoral dissertation committees, I also provide a supervisory/mentoring role for some of the students of my collaborators, specifically for teaching ANTsX software usage.

* Jesse Birchfield (advisor: Andrew Holbrook, 2022--present), Department of Biostatistics, University of California, Los Angeles, current dissertation committee member.
* Batool Rizvi (advisor: Michael Yassa, 2020--present), Department of Neurobiology and Behavior, University of California, Irvine. Co-author (one accepted and one submitted).

**Previous**

* Andrew Holbrook (mentor: Daniel Gillen, 2017--2020), Department of Statistics, University of California, Irvine. Collaborator/advisor on a large-scale Alzheimers disease effort. Co-author (PMID: 31356207 and PMID: 32875052).
* Fae Kronmen (advisor: Yongsoo Kim, 2022--2024), Department of Neural and Behavioral Sciences, Penn State University, Collaborator/advisor on development using ANTsX. Co-author (PMID: 39433760).
* Kelsey Tyssowski (advisor: Hopi Hoekstra, 2021--2024), Department of Organismic and Evolutionary Biology, Harvard University, Collaborator/advisor on development using ANTsX. Co-author (public digital mouse atlases and publication in progress).
* Andrew Grainger (advisor: Weibin Shi, 2017--2018), Department of Radiology and Medical Imaging, University of Virginia**.** Collaborator/advisor on development using ANTsX. Co-author (PMID: 30235253 and PMID: 32771313).
* Zachariah Reagh (advisor: Michael Yassa, 2017), Department of Neurobiology and Behavior, University of California, Irvine. Co-author (PMID: 29518359, PMID: 31356207, and PMID: 30318785).
* Dana McMakin (advisor: Aaron T. Mattfeld, 2020--2021), Cognitive Neuroscience Program, Department of Psychology, Florida International University. Co-author (PMID: 34270763).
* Nena Sinha (advisor: Mark Gluck, 2018), Center for Molecular and Behavioral Neuroscience, Rutgers University-Newark**.** Co-author **(**PMID: 30318785 and PMID: 29909179).
* Kevin Donovan (advisor: Russel T Shinohara, 2023--2024), Penn Statistics in Imaging and Visualization Center, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania. Co-author (PMID: 36824801).
* Andrew Chen (advisors: Russell T Shinohara/Haochang Shou, 2021-2022), Penn Statistics in Imaging and Visualization Center, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania. Co-author (PMID: 34904312).
* Joanne C. Beer (advisors: Russell T Shinohara/Kristin A Linn, 2019--2021), Penn Statistics in Imaging and Visualization Center, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania. Co-author (PMID: 32640273).
* Danni Tu (advisor: Kristin A Linn, 2021--2022), Penn Statistics in Imaging and Visualization Center, Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania. Co-author (PMID: 35731973).
* Yi Xin (advisor: Maurizio Cereda, 2018--2020), Department of Radiology, University of Pennsylvania. Co-author (PMID: 25640150, PMID: 29420904 and PMID: 32773690).

1. **MASTER’S AND PH.D. THESES DIRECTED AND POSTDOCTORAL FELLOWS SUPERVISED**

* Daniel Brennan (advisor: Junghoon Kim, 2021--2024), School of Medicine, College University of New York, dissertation committee member.
* Sebastian Giudice (advisor: Matthew Panzer, 2019--2020), Center for Applied Mathematics, Department of Mechanical and Aerospace Engineering, University of Virginia. Dissertation committee member (2020). Co-author (PMID: 3275547).

1. **PAPERS PUBLISHED OR IN PRESS**
2. **Peer Reviewed**

**2025**

1. **Nicholas J. Tustison**, Min Chen, Fae N. Kronman, Jeffrey T. Duda, Clare Gamlin, Mia G. Tustison, Michael Kunst, Rachel Dalley, Staci Sorenson, Quanxi Wang, Lydia Ng, Yongsoo Kim, and James C. Gee. The ANTsX Ecosystem for Mapping the Mouse Brain. Submitted.
2. Destiny E. Berisha, Batool Rizvi, Miranda G. Chappel-Farley, **Nicholas Tustison**, Lisa Taylor, Abhishek Dave, Negin S. Sattari, Ivy Y. Chen, Kitty K. Lui, John C. Janecek, David Keator, Ariel B. Neikrug, Ruth M. Benca, Michael A. Yassa, and Bryce A. Mander. Cerebrovascular pathology mediates associations between hypoxemia during rapid eye movement sleep and medial temporal lobe structure and function in older adults. Submitted.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

**2024**

1. Allyson T. Gage, James R. Stone, Elisabeth A. Wilde, Stephen R. McCauley, Robert C. Welsh, John P. Mugler, III, **Nick Tustison**, Brian Avants, Christopher T. Whitlow, Lee Lancashire, Seema D. Bhatt, and Magali Haas. Normative Neuroimaging Library: Designing a Comprehensive and Demographically Diverse Dataset of Healthy Controls to Support Traumatic Brain Injury Diagnostic and Therapeutic Development. *J Neurotrauma*. 41(23-24):2497-2512, Dec 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Emily L Dennis, Jared Rowland, Carrie Esopenko, **Nicholas Tustison**, Mary Newsome, Brian Avants, Jessica Gill, Sidney Hinds II, Kimbra Kenney, Hannah Lindsey, Sarah Martindale-Supak, Mary Jo Pugh, Randall Scheibel, Pashtun-Poh Shahim, Robert Shih, James R Stone, Maya Troyanskaya, William C Walker, J Kent Werner, Gerald York, David Cifu, David Tate, and Elisabeth A Wilde. Brain volume changes following blast-related mild TBI in service members and veterans: a LIMBIC-CENC study. *JAMA Netw Open*. 7(11):e2443416, Nov 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Fae A Kronman, Josephine K Liwang, Rebecca Betty, Daniel J Vanselow, Yuan-Ting Wu, **Nicholas J Tustison**, Ashwin Bhandiwad, Steffy B Manjila, Jennifer A Minteer, Donghui Shin, Choong Heon Lee, Rohan Patil, Jeffrey T Duda, Luis Puelles, James C Gee, Jiangyang Zhang, Lydia Ng, and Yongsoo Kim. Developmental Mouse Brain Common Coordinate Framework. *Nature Communications*. 15:9072, Oct 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Chenxi Yuan, Jinhao Duan, **Nicholas J. Tustison**, Kaidi Xu, Rebecca A Hubbard, and Kristin A Linn. ReMiND: Recovery of Missing Neuroimaging using Diffusion Models with Application to Alzheimer's Disease.  *Imaging Neuroscience*. 2:1-14, 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Fengling Hu, Alfredo Lucas, Andrew A. Chen, Kyle Coleman, Hannah Horng, Raymond W.S. Ng, **Nicholas J. Tustison**, Kathryn A. Davis, Haochang Shou, Mingyao Li, Russell T. Shinohara, and The Alzheimer’s Disease Neuroimaging Initiative. DeepComBat: A Statistically Motivated, Hyperparameter- Robust, Deep Learning Approach to Harmonization of Neuroimaging Data. *Human Brain Mapping*. 45(11):e26708, Aug 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. **Nicholas J. Tustison**, Michael A. Yassa, Batool Rizvi, Andrew J. Holbrook, Mithra T. Sathishkumar, Mia G. Tustison, James C. Gee, James R. Stone, and Brian B. Avants. ANTsX neuroimaging-derived structural phenotypes of UK Biobank. *Scientific Reports*. 14(1):8848, Apr 2024.
2. James R. Stone, Brian B. Avants, **Nicholas Tustison**, Jessica Gill, Elisabeth A. Wilde, George E. Wahlen, Kiel D. Neumann, Leslie A. Gladney, Madison O. Kilgore, F. Bowling, Christopher M. Wilson, John F. Detro, Heather G. Belanger, Katryna Deary, Hans Linsenbardt, and Stephen T. Ahlers. Neurological effects of repeated blast exposure in Special Operations personnel. *Journal of Neurotrauma*.  *Journal of Neurotrauma*. 41(7-8):942-956, Apr 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Kun Qing, Talissa Altes, John Mugler III, **Nick Tustison**, Jaime Mata, Kai Ruppert, Peter Komlosi, Xue Feng, Ke Nie, Li Zhao, Zhixing Wang, F. William Hersman, Iulian Ruset, Bo Liu, Y. Michael Shim, and W. Gerald Teague. Pulmonary MRI with Hyperpolarized Xenon-129 Demonstrates Novel Alterations in Gas Transfer Across the Air-blood Barrier in Asthma. *Medical Physics. 51(4):2413-2423,* Apr 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Natalie DiProspero, Mithra Sathishkumar, John Janecek, Anna Smith, Liv McMillan, Melissa Peterson, Michael Phelan, **Nicholas Tustison**, David B. Keator, Eric Doran, Christine Hom, Dana Nguyen, Howard Andrews, Sharon Krinsky-McHale, Adam Brickman, H. Diana Rosas, Florence Lai, Elizabeth Head, Mark Mapstone, Nicole Schupf, Wayne Silverman, Ira T. Lott, Sid O’Bryant, and Michael A. Yassa. Neurofilament light chain concentration mediates the association between regional medial temporal lobe structure and memory in adults with Down syndrome. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring*, 16(1):e12542, Feb. 2024.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

**2023**

1. Danni Tu, Manu S. Goyal, Jordan D. Dworkin, Samuel Kampondeni, Lorenna Vidal, Eric Biondo-Savin, Sandeep Juvvadi, Prashant Raghavan, Jennifer Nicholas, Karen Chetcuti, Kelly Clark, Timothy Robert-Fitzgerald, Theodore D. Satterthwaite, Paul Yushkevich, Christos Davatzikos, Guray Erus, **Nicholas J. Tustison**, Douglas G. Postels, Terrie E. Taylor, Dylan S. Small, and Russell T. Shinohara. Automated Analysis of Low-Field Brain MRI in Cerebral Malaria. *Biometrics*, 79(3):2417-2429, Sep 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. William J. Garrison, Kun Qing, Mu He, Li Zhao, **Nicholas J. Tustison**, Jaime F. Mata, Y. Michael Shim, Alan M. Ropp, Talissa A. Altes, John P. Mugler III, and G. Wilson Miller\*. Lung Volume Dependence and Repeatability of Hyperpolarized 129Xe MRI Gas Uptake Metrics in Healthy Volunteers and Patients with COPD.  *Radiology: Cardiothoracic Imaging*, 5(3):e220096, June 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Batool Rizvi\*, Mithra T Sathishkumar, Soyun Kim, Freddie Márquez, Steven J. Granger, Myra S. Larson, Blake A. Miranda, Martina K. Hollearn, L. McMillan, B. Nan, **N. Tustison**, P. Lao, A. Brickman, Dana E. Greenia, M. Corrada, C. Kawas, and M. Yassa. Posterior white matter hyperintensities are associated with reduced medial temporal lobe subregional integrity and long-term memory in older adults. *Neuroimage Clin*, 37:103308, 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Jay Hegdé, **Nicholas J Tustison**, William T. Parker, Fallon B. Branch, Nathan Yanasak, and Lorie A. Stumpo. An Anatomical Template for the Normalization of Medical Images of Adult Human Hands. *Diagnostics*, 13(12):2010, Jun 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Kun Qing, Talissa A. Altes, John P. Mugler III, Jaime F. Mata, **Nicholas J. Tustison**, Kai Ruppert, Juliana Bueno, Lucia Flors, Y. Michael Shim, Li Zhao, Joanne Cassani, W. Gerald Teague, John S Kim, Zhixing Wang, Iulian C. Ruset, F. William Hersman, and Borna Mehrad. Hyperpolarized Xenon-129: A New Tool to Assess Pulmonary Physiology in Patients with Pulmonary Fibrosis. *Biomedicines*, 11(6):1533, May 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Adam Kimbler, Dana McMakin, **Nicholas J. Tustison**, and Aaron T. Mattfeld\*. Differential effects of emotional valence on mnemonic performance with greater hippocampal maturity. *Learning and Memory*, 30(3):55-62, Mar 2023.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

**2022**

1. Zhuang Song\*, Anithapriya Krishnan, Laura Gaetano, **Nicholas J. Tustison**, David Clayton, Alex de Crespigny, Thomas Bengtsson, Xiaoming Jia, and Richard A.D. Carano. Deformation-based morphometry identifies deep brain structures protected by ocrelizumab. *Neuroimage Clin*.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Stephen Guan, **Nick Tustison**, Kun Qing, Yun Michael Shim, John Mugler III, Talissa Altes, Dana Albon, Deborah Froh, Borna Mehrad, James Patrie, Alan Ropp, Braden Miller, Jill Nehrbas, Jaime Mata\*. 3D Single-Breath Chemical Shift Imaging Hyperpolarized Xe-129 MRI of Healthy, CF, IPF, and COPD Subjects. *Tomography*, 8(5), 2574-2587, Oct 2022.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Raghav Mehta, Angelos Filos, Ujjwal Baid, Chiharu Sako, Richard McKinley, Michael Rebsamen, Katrin Dätwyler, Raphael Meier, Piotr Radojewski, Gowtham Krishnan Murugesan, Sahil Nalawade, Chandan Ganesh, Ben Wagner, Fang F. Yu, Baowei Fei, Ananth J. Madhuranthakam, Joseph A. Maldjian, Laura Daza, Catalina Gómez, Pablo Arbeláez, Chengliang Dai, Shuo Wang, Hadrien Raynaud, Yuanhan Mo, Elsa Angelini, Yike Guo, Wenjia Bai, Subhashis Banerjee, Linmin Pei, Murat AK, Sarahi Rosas-González, Illyess Zemmoura, Clovis Tauber, Minh H. Vu, Tufve Nyholm, Tommy Löfstedt, Laura Mora Ballestar, Veronica Vilaplana, Hugh McHugh, Gonzalo Maso Talou, Alan Wang, Jay Patel, Ken Chang, Katharina Hoebel, Mishka Gidwani, Nishanth Arun, Sharut Gupta, Mehak Aggarwal, Praveer Singh, Elizabeth R. Gerstner, Jayashree Kalpathy-Cramer, Nicolas Boutry, Alexis Huard, Lasitha Vidyaratne, Md Monibor Rahman, Khan M. Iftekharuddin, Joseph Chazalon, Elodie Puybareau, Guillaume Tochon, Jun Ma, Mariano Cabezas, Xavier Llado, Arnau Oliver, Liliana Valencia, Sergi Valverde, Mehdi Amian, Mohammadreza Soltaninejad, Andriy Myronenko, Ali Hatamizadeh, Xue Feng, Quan Dou, **Nicholas Tustison**, Craig Meyer, Nisarg A. Shah, Sanjay Talbar, Marc-Andr Weber, Abhishek Mahajan, Andras Jakab, Roland Wiest, Hassan M. Fathallah-Shaykh, Arash Nazeri, Mikhail Milchenko, Daniel Marcus, Aikaterini Kotrotsou, Rivka Colen, John Freymann, Justin Kirby, Christos Davatzikos, Bjoern Menze, Spyridon Bakas, Yarin Gal, Tal Arbel\*. QU-BraTS: MICCAI BraTS 2020 Challenge on Quantifying Uncertainty in Brain Tumor Segmentation — Analysis of Ranking Scores and Benchmarking Results.  *The Journal of Machine Learning for Biomedical Imaging*. Aug 2022.

Dr. Tustison participated in the BraTS 2020 Challenge.

1. Nazek Queder, Michael J. Phelan, Lisa Taylor, **Nicholas Tustison**, Eric Doran, Christy Hom, Dana Nguyen, Florence Lai, Margaret Pulsifer, Julie Price, William C. Kreisl, Diana H. Rosas, Sharon Krinsky-McHale, Adam Brickman, Michael A. Yassa, Nicole Schupf, Wayne Silverman, Ira T. Lott, and David B. Keator\*. Joint-label fusion brain atlases for dementia research in down syndrome.  *Alzheimers Dement (Amst)*, 14(1):e12324, May 2022.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Andrew A. Chen, Joanne C. Beer, **Nicholas J. Tustison**, Philip A. Cook, Russell T. Shinohara, Haochang Shou\*, for the Alzheimer’s Disease Neuroimaging Initiative. Mitigating Site Effects in Covariance for Machine Learning in Neuroimaging Data.  *Hum Brain Mapp*, 43(4):1179-1195, Mar 2022.

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1. Dana L McMakin, Adam Kimbler, **Nicholas J. Tustison**, Jeremy W Pettit, and Aaron T. Mattfeld\*. Negative Overgeneralization is Associated with Pattern Completion in Peripubertal Youth. *Soc Cogn Affect Neurosci*, 17(2):231-240, Feb 2022.

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**2021**

1. Andrew T. Grainger, Arun Krishnaraj, Michael H. Quinones, **Nicholas J. Tustison**, Samantha Epstein, Daniela Fuller, Aakash Jha, Kevin L. Allman, Weibin Shi\*. Deep learning-based quantification of abdominal subcutaneous and visceral fat volume on CT images.  *Acad Radiol*, 28(11):1481-1487, Nov 2021.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Mu He, Kun Qing, **Nicholas J. Tustison**, Zach Beaulac, Tabitha W. King, Thomas B. Huff, Mikell Paige, Kranthikiran Earasi, Roselove Nunoo-Asare, Sarah Struchen, Marie Burdick, Zhimin Zhang, Alan Ropp, Grady W. Miller, James T. Patrie, Jaime F. Mata, John P. Mugler III, and Yun M. Shim\*. Characterizing gas exchange physiology in healthy young electronic-cigarette users with hyperpolarized 129Xe MRI: a pilot study.  *Int J Chron Obstruct Pulmon Dis*, 16:3183-3187, Nov 2021.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. **Nicholas J. Tustison\***, Talissa A. Altes, Kun Qing, Mu He, G. Wilson Miller, Brian B. Avants, Yun M. Shim, James C. Gee, John P. Mugler III, and Jaime F. Mata. Image- versus histogram-based considerations in semantic segmentation of pulmonary hyperpolarized gas images.  *Magn Reson Med*, 86(5):2822-2836, Nov 2021.
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1. William Teague\*, Jaime Mata, Kun Qing, **Nicholas Tustison**, John Mugler, Craig Meyer, Eduard de Lange, Michael Shim, Kristin Wavell, Talissa Altes. Measures of Ventilation Heterogeneity Mapped with Hyperpolarized Helium-3 (HHe-3) MRI Demonstrate a T2-High Phenotype in Asthma.  *Pediatr Pulmonol*, 56(6):1440-1448, Jun 2021.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. **Nicholas J. Tustison\***, Philip A. Cook, Andrew J. Holbrook, Hans J. Johnson, John Muschelli, Gabriel A. Devenyi, Jeffrey T. Duda, Sandhitsu R. Das, Nicholas C. Cullen, Daniel L. Gillen, Michael A. Yassa, James R. Stone, James C. Gee, and Brian B. Avants for the Alzheimer’s Disease Neuroimaging Initiative. The ANTsX ecosystem for quantitative biological and medical imaging. *Sci Rep*. 11(1):9068, Apr 2021.
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Dr. Tustison processed the data and provided direction with respect to the software used.

**2020**

1. James Stone\*, Brian Avants, **Nicholas Tustison**, Eric Wasserman, Jessica Gill, Elena Polejaeva, Kristine Dell, Walter Carr, Angela Yarnell, Matthew LoPresti, Peter Walker, Meghan O’Brien, Natalie Domeisen, Alycia Quick, Claire Modica, John D. Hughes, Francis Haran, Carl Goforth, and Stephen Ahlers. Functional and structural neuroimaging correlates of repetitive low-level blast exposure in career breachers.  *J Neurotrauma*, 37(23):2468-2481, Dec 2020.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Lukasz Myc, Kun Qing, Mu He, **Nicholas Tustison**, Zixuan Lin, Ani W Manichaikul, James Patrie, Joanne Cassani, Roselove N Nunoo-Asare, Yong Huang, Zaid Obaida, Sina Tafti, Alan M Ropp, Grady Wilson Miller, Jaime Mata, Talissa Altes, John Mugler, and Y Michael Shim\*. Characterisation of gas exchange in COPD with dissolved-phase hyperpolarised xenon-129 MRI.  *Thorax*, 76(2):178-181, Nov 2020.

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1. Yi Xin, Maurizio Cereda, Hooman Hamedani, Kevin T. Martin, Nicholas J. Tustison, Mehrdad Pourfathi, Stephen Kadlecek, Sarmad Siddiqui, Faraz Amzajerdian, Marc Connell, Nicholas Abate, Agi Kajanaku, Ian Duncan, James C. Gee, and Rahim R. Rizi\*. Positional Therapy and Regional Pulmonary Ventilation: High Resolution Alignment of Prone and Supine Computed Tomography Images in a Large Animal Model.  *Anesthesiology*, 133(5): 1093–1105, Nov 2020.

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1. Erin D. Bigler\*, Marc Skiles, Benjamin S.C. Wade, Tracy J. Abildskov, **Nicholas J. Tustison**, Randall S. Scheibel, Mary R. Newsome, Andrew R. Mayer, James R. Stone, Brian A. Taylor, David F. Tate, William C. Walker, Harvey S. Levin, and Elisabeth A. Wilde. FreeSurfer 5.3 versus 6.0: Are volumes comparable? A Chronic Effects of Neurotrauma Consortium Study.  *Brain Imaging Behav*, 14(5):1318-1327, Oct 2020.

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1. Chase S Hall\*, James D Quirk, Charles W Goss, Daphne Lew, Jim Kozlowski, Robert P Thomen, Jason C Woods, **Nicholas J. Tustison**, John P Mugler 3rd, Lora Gallagher, Tammy Koch, Ken B Schechtman, Iulian C Ruset, F William Hersman, Mario Castro. Single-Session Bronchial Thermoplasty Guided by 129Xe Magnetic Resonance Imaging.  *Am J Respir Crit Care Med*, 202(4):524-534, Aug 2020.

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1. Duc M. Nguyen, Michael A. Yassa, **Nicholas J. Tustison**, Jared M. Roberts, Alexandra Kulikova, Alyson Nakamura, Elena I. Ivleva, Erin Van Enkevort, and E. Sherwood Brown\*. The Relationship Between Cumulative Exogenous Corticosteroid Exposure and Volumes of Hippocampal Subfields and Surrounding Structures.  *J Clin Psychopharmacol*, 39(6):653-657, Nov/Dec 2019.

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2. E. Brown\*, Alexandra Kulikova, Erin Van Enkevort, Alyson Nakamura, Elena Ivleva, **Nicholas Tustison**, Jared Roberts, Michael Yassa, Changho Choi, Alan Frol, David Khan, Miguel Vazquez, Traci Holmes, and Kendra Malone. A Randomized Trial of an NMDA Receptor Antagonist for Reversing Corticosteroid Effects on the Human Hippocampus.  *Neuropsychopharmacology*, 44(13):2263-2267, Dec 2019.

Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

1. Neda Jahanshad\*, Joshua Faskowitz, Gennady Roshchupkin, Derrek P. Hibar, Boris A. Gutman, **Nicholas J. Tustison**, Hieab H.H. Adams, Wiro J. Niessen, Meike W. Vernooij, M. Arfan Ikram, Marcel P. Zwiers, Alejandro Arias Vasquez, Barbara Franke, Jennifer L. Kroll, Benson Mwangi, Jair C. Soares, Alex Ing, Sylvane Desrivieres, Gunter Schumann, Narelle K. Hansell, Greig I. de Zubicaray, Katie L. McMahon, Nicholas G. Martin, Margaret J. Wright, Paul M. Thompson and the Alzheimer’s Disease Neuroimaging Initiative. Multi-Site meta-analysis of morphometry.  *IEEE/ACM Trans Comput Biol & Bioinform*, 16(5):1508-1514, Oct 2019.

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1. **Nicholas J. Tustison\***, Andrew J. Holbrook, Brian B. Avants, Jared M. Roberts, Philip A. Cook, Zachariah M. Reagh, Jeffrey T. Duda, James R. Stone, Daniel L. Gillen, and Michael A. Yassa for the Alzheimer’s Disease Neuroimaging Initiative. Longitudinal mapping of cortical thickness measurements: an ADNI-based evaluation study.  *J Alzheimers Dis*, 71(1):165-183, Sep 2019.
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1. 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*, 29(6):527-538, Jun 2019.

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1. Xue Feng\*, Kun Qing, **Nicholas J. Tustison**, Craig H. Meyer, and Quan Chen. Deep convolutional neural network for segmentation of thoracic organs-at-risk using cropped 3D images.  *Medical Physics*, 46(5):2169-2180, May 2019.

Dr. Tustison collaborated on the software.

1. Nasreen Sayed, Changho Choi, **Nicholas Tustison**, Jared Roberts, Michael Yassa, Erin Van Enkevort, Alyson Nakamura, Elena I Ivleva, Prabha Sunderajan, David A Khan, Miguel Vazquez, Bruce McEwen, Alexandra Kulikova, Traci Holmes, and Sherwood Brown\*. A Randomized, Double-Blind, Placebo-Controlled Trial of Lamotrigine for Prescription Corticosteroid Effects on the Human Hippocampus. *Eur Neuropsychopharmacol*, 29(3):376-383, Mar 2019.

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1. **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*, 26(3):412-423, Mar 2019.
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Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

**2018**

1. 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, Sep 2018.

Dr. Tustison developed and trained the deep learning models.

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1. Neha Sinha, Chelsie N., Berg, **Nicholas J. Tustison**, Ashlee Shaw, Diane Hill, Michael A. Yassa, and Mark A. Gluck\*. APOE ε4 Status in Healthy Older African Americans is Associated with Deficits in Pattern Separation and Hippocampal Hyperactivation.  *Neurobiol Aging*, 26;69:221-229, May 2018.

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Dr. Tustison provided direction with respect to the software used and guidance on analysis protocols.

**2017**

1. Cereda M\*, Xin Y, Hamedani H, Bellani G, Kadlecek S, Clapp J, Guerra L, Meeder N, Rajaei J, **Tustison NJ**, Gee JC, Kavanagh BP, and Rizi RR. Tidal Changes on CT and Progression of ARDS.  *Thorax*, 72(11):981-989, Nov 2017.

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Dr. Tustison participated in the challenge described by the manuscript and won the best paper award.

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**2016**

1. Stone JR\*, Wilde EA, Taylor BA, Tate DF, Levin H, Bigler ED, Scheibel RS, Newsome MR, Mayer AR, Abildskov T, Black GM, Lennon MJ, York GE, Agarwal R, DeVillasante J, Ritter JL, Walker PB, Ahlers ST, and **Tustison NJ**. Supervised learning technique for the automated identification of white matter hyperintensities in traumatic brain injury. *Brain Inj,* 30(12) :1442-1451, 2016.

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Dr. Tustison provided the image analysis techniques for quantifying ventilation.

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Dr. Tustison performed the fMRI analysis.

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The ANTs software library, written by Dr. Tustison, was used to provide cortical thickness measures.

1. Hasan KM\*, Mwangi B, Cao B, Keser Z, **Tustison NJ**, Kochunov P, Frye RE, Savatic M, and Soares J. Entorhinal cortex thickness across the human lifespan. *J Neuroimaging*, 26(3) :278-82, May 2016.

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The core machine learning framework was written by Dr. Tustison and enhanced for lesion application.

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Dr. Tustison provided the image analysis techniques for quantifying ventilation.

**2015**

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1. Menze BH\*, Jakab A, Bauer S, Kalpathy-Cramer J, Farahani K, Kirby J, Burren Y, Porz N, Slotboom J, Wiest R, Lanczi L, Gerstner E, Weber M-A, Arbel T, Avants BB, Ayache N, Buendia P, Collins DL, Cordier N, Corso JJ, Criminisi A, Das T, Delingete H, Demiralp C, Durst CR, Dojat M, Doyle S, Festa J, Forbes F, Geremia E, Glocker B, Golland P, Guo X, Hamamci A, Iftekharuddin KM, Jena R, John NM, Konukoglu E, Lashkari D, Mariz JA, Meier R, Pereira S, Precup D, Price SJ, Riklin-Raviv T, Reza SMS, Ryan M, Schwartz L, Shin H-C, Shotton J, Silva CA, Sousa N, Subbanna NK, Szekely G, Taylor TJ, Thomas OM, **Tustison NJ**, Unal G, Vasseur F, Wintermark M, Ye DH, Zhao L, Zhao B, Zikic D, Prastawa M, Reyes M, and Leemput KV. The Multimodal Brain Tumor Image Segmentation Benchmark (BRATS). *IEEE Trans Med Imaging*, 34(10):1993-2024, October 2015.

This manuscript details automated brain tumor segmentation competitions for the years 2012 and 2013. Dr. Tustison competed in and won the competition in 2013.

1. Roberts JM, **Tustison N**, Stone J,Avants B, Cook P, and Yassa MA\*. Entorhinal cortical thickness, ApoE4 status, and cognitive decline in ADNI participants. *Alzheimers Dement,* 11(7), Supplement, Page P35, July 2015.

Dr. Tustison provided the processed ADNI data and mentored the first author in the use of ANTs to derive further measurements for this publication.

1. Durst CR\*, Michael N, **Tustison NJ**, Patrie JT, Raghavan P, Wintermark M, and Velan SS. Noninvasive Evaluation of the Regional Variations of GABA using Magnetic Resonance Spectroscopy at 3 Tesla. *Magn Reson Imaging*, 33(5):611-7, June 2015.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. **Tustison NJ\***, Shrinhidi KL, Wintermark M, Durst CR, Kandel BM, Gee JC, Grossman MC, and Avants BB. Optimal symmetric multimodal templates and concatenated random forests for supervised brain tumor segmentation (simplified) with ANTsR. *Neuroinformatics*, 13(2):209-225, April 2015.
2. Avants BB\*, Johnson HJ, and **Tustison NJ**. Neuroinformatics and The Insight ToolKit. *Front Neuroinform,* 9:5, March 2015.

This article introduces a special journal issue partially edited by Dr. Tustison.

1. Avants B, Duda J, Kilroy E, Jann K, Kandel B, Yan L, Jog M, **Tustison N**, Smith R, Wang Y, Krasileva K, Rapretto M, and Wang D. The Pediatric Template of Brain Perfusion. *Scientific Data*, February 2015.

The ANTs software library, written by Drs. Avants and Tustison, was used to provide the quantitative image measures.

1. Xin Y, Song G, Cereda M, Kadlecek S, Hamedani H, Jiang Y, Rajaei J, Clapp J, Profka H, Meeder N, Wu J, **Tustison N**, Gee J, and Rizi R\*. Semi-Automatic Segmentation of Longitudinal Computed Tomography Images in a Rat Model of Lung Injury by Surfactant Depletion. *J Appl Physiol,* 118(3):377-85, February 2015.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

**2014**

1. Yoder JH, Peloquin JM, Song G, **Tustison NJ**, Moon SM, Wright AC, Vresilovic EJ, Gee JC, and Elliott DM\*. Internal Human Intervertebral Disc 3D Strains Under Axial Compression Quantified Non-invasively with MRI and Image Registration. *J Biomech Eng-T ASME*, 136(11), Nov 2014.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. **Tustison NJ\***, Cook PA, Klein A, Song G, Das SR, Duda JT, Kandel BM, van Strien N, Stone JR, Gee JC, and Avants BB. Large-Scale Evaluation of ANTs and FreeSurfer Cortical Thickness Measurements. *Neuroimage*, 99:166-179, Oct 2014.
2. Said N, Elias WE, Raghavan P, Cupino A, **Tustison N**, Frysinger R, Patrie J, Xin W, and Wintermark M\*. Correlation of Diffusion Tensor Tractography and Intraoperative Macro-Stimulation during Deep Brain Stimulation for Parkinson's Disease. *J Neurosurg,* 25:1-7, July 2014.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. Wintermark M\*, **Tustison NJ**, Patrie JT, Xin W, Demartini N, Eames M, Sumer S, Lau B, Cupino A, Snell J, Hananel A, Kassell N, and Aubry JF. T1-weighted MRI as a substitute to CT for refocusing planning in MR-guided focused ultrasound. *Phys Med Biol*, 59(13):3599-614, July 2014.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. Teague WG\*, **Tustison NJ**, and Altes TA. Ventilation Heterogeneity in Asthma. *J Asthma,* 51(7):677-84, Sept 2014.

Dr. Tustison provided much of the quantitative analysis discussed.

1. Avants BB\*, **Tustison NJ**, Stauffer M, Song G, Wu B, and Gee JC. The Insight ToolKit Image Registration Framework. *Front Neuroinform*, 8:44, 2014.

Dr. Tustison was one of the principal architects and developers of the ITK image registration toolkit.

1. Wintermark M\*, Huss DS, Shah BB, **Tustison N**, Druzgal TJ, Kassell N, and Elias J. Thalamic Connectivity in Patients with Essential Tremor Treated with MR Imaging-guided Focused Ultrasound: In Vivo Fiber Tracking by Using Diffusion-Tensor MR Imaging. *Radiology*, 272(1):202-9, July 2014.

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1. **Tustison NJ\***, Avants BB, Cook PA, Kim J, Whyte J, Gee JC, and Stone JR. Logical Circularity in voxel-based analysis: normalization strategy may induce statistical bias. *Hum Brain Mapp*, 35:745-759, March 2014.
2. Durst CR, Raghavan P, Shaffrey ME, Schiff D, Lopes MB, Sheehan JP, **Tustison NJ**, Patrie JT, Xin W, Elias WJ, Liu KC, Helm GA, Cupino A, and Wintermark M\*. Multimodal MR imaging model to predict tumor infiltration in patients with gliomas. *Neuroradiology*, 56(2):107-115, February 2014.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

**2013**

1. **Tustison NJ\*** and Avants BB. Explicit B-spline regularization in diffeomorphic image registration. *Front Neuroinform*, 7:39, 2013.
2. **Tustison NJ\*,** Johnson HJ, Rohlfing T, Klein A, Ghosh SS, Ibanez L, and Avants BB. Instrumentation bias in the use and evaluation of scientific software: recommendations for reproducible practices in the computational sciences. *Front Neurosci,* 7:162, 2013.

**2012**

1. Song G\*, Barbosa JR EM, **Tustison NJ**, Gefter WB, Kreider M, Gee JC, and Torigian DA. A Comparative Study of HRCT Image Metrics and PFT Values for Characterization of ILD and COPD. *Acad Radiol*, 19(7):857–64, July 2012.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

**2011**

1. Avants BB†\*, **Tustison NJ**†, Wu J, Cook PA, and Gee JC. An Open Source Framework for n-Tissue Segmentation with Evaluation on Public Data. *Neuroinformatics*, 9(4):381–400, December 2011. Joint first authorship.
2. Murphy K\*, van Ginneken B, Reinhardt JM, Kabus S, Ding K, Deng X, Cao K, Du K, Christensen GE, Garcia V, Vercauteren T, Ayache N, Commowick O, Malandain G, Glocker B, Paragios N, Navab N, Gorbunova V, Sporring J, de Bruijne M, Han X, Heinrich MP, Schnabel JA, Jenkinson M, Lorenz C, Modat M, McClelland JR, Ourselin S, Muenzing SEA, Viergever MA, De Nigris D, Collins DL, Arbel T, Peroni M, Li R, Sharp GE, Schmidt-Richberg A, Ehrhardt J, Werner R, Smeets D, Loeckx D, Song G, **Tustison N**, Avants B, Gee JC, Staring M, Klein S, Stoel BC, Urschler M, Werlberger M, Vandemeulebroucke J, Rit S, Sarrut D, and Pluim JPW. Evaluation of Registration Methods on Thoracic CT: The EMPIRE10 Challenge. *IEEE Trans Med Imaging*, 30(11):1901–20, November 2011.

This manuscript details a lung registration challenge occurring in 2010 in which Dr. Tustison’s team competed and won.

1. Yilmaz C\*, **Tustison NJ**, Dane DM, Ravikumar P, Takahashi M, Gee JC, and Hsia CCW. Functional computed tomography: Progressive adaptation in regional mechanics following extensive lung resection.  *J Appl Physiol*, 111(4):1150–8, October 2011.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. **Tustison NJ\***, Avants BB, Altes TA, de Lange EE, Mugler III JP, and Gee JC. Ventilation-Based Segmentation of the Lungs Using Hyperpolarized 3He MRI. *J Magn Reson Imaging*, 34(4):831–841, October 2011.
2. Barbosa Jr EM\*, Song G, **Tustison N**, Kreider M, Gee JC, Gefter W, and Torigian DA. Computational Analysis of Thoracic Multidetector Row HRCT for Segmentation and Quantification of Small Airway Air Trapping and Emphysema in Obstructive Pulmonary Disease. *Acad Radiol*, 18(10):1258-1269, October 2011.

The ANTs software library, written by Dr. Tustison, was used to provide the quantitative image measures.

1. **Tustison NJ\***, Avants BB, Siqueira M, and Gee JC. Topological Well-Composedness and Glamorous Glue: A Digital Gluing Algorithm for Topologically Constrained Level Set Segmentation. *IEEE Trans Image Process*, 20(6):1756-1771, June 2011.
2. **Tustison NJ\***, Cook TS, Song G, and Gee JC. Pulmonary Kinematics from Image Data: A Review. *Acad Radiol*, 18(4):402–417, April 2011.
3. **Tustison NJ\***, Awate SP, Song G, Cook TS, and Gee JC. Point Set Registration Using Havrda-Charvat-Tsallis Entropy Measures. *IEEE Trans Med Imaging*, 30(2):451–460, February 2011.
4. Avants BB\*, **Tustison NJ**, Song G, Cook PA, Klein A, and Gee JC. A Reproducible Evaluation of ANTs Similarity Metric Performance in Brain Image Registration. *Neuroimage*, 54(3):2033–2044, February 2011.

Drs. Avants and Tustison jointly wrote the software and performed the evaluation.

**2010**

1. **Tustison NJ\***, Avants BB, Cook PA, Egan A, Zheng Y, Yushkevich PA, and Gee JC. N4ITK: Improved N3 Bias Correction. *IEEE Trans Med Imaging*, 29(6):1310–1320, June 2010.
2. **Tustison NJ\***, Altes TA, Song G, de Lange EE, Mugler III JP, and Gee JC. Feature Analysis of Hyperpolarized Helium-3 Pulmonary MRI: A Study of Asthmatics versus Non-Asthmatics. *Magn Reson Med*, 63(6):1448–1455, June 2010.
3. **Tustison NJ\***, Awate SP, Cai J, Altes TA, Miller GW, de Lange EE, Mugler III JP, and Gee JC. Pulmonary Kinematics from Tagged Hyperpolarized Helium-3 MRI. *J Magn Reson Imaging*, 31(5):1236–1241, May 2010.

**2009**

1. **Tustison NJ\***, Avants BB, and Gee JC. Directly manipulated free-form deformation image registration. *IEEE T Image Process,* 18(3):624–35, March 2009.

**2008**

1. Siqueira M\*, Latecki LJ, **Tustison N**, Gallier J, and Gee J. Topological Repairing of 3D Digital Images. *J Math Imaging Vis,* 30(3):249–274, March 2008.

Dr. Tustison implemented the repairing algorithm and ran the evaluation.

**2006**

1. **Tustison NJ\*** and Amini AA. Biventricular myocardial strains via nonrigid registration of anatomical NURBS model. *IEEE Trans Med Imaging* 25(1):94–112, January 2006.

**2003**

1. **Tustison NJ\*,** Davila-Roman VG, and Amini AA. Myocardial kinematics from tagged MRI based on a 4-D B-spline model. *IEEE T Biomed Eng,* 50(8):1038–1040, August 2003.

**2000**

1. Hagspiel KD\*, Altes TA, Mugler III JP, Mata JF, **Tustison NJ**, and Brookeman JR. MR virtual colonography using hyperpolarized 3He as an endoluminal contrast agent: demonstration of feasibility. *Magn Reson Med,* 44(5):813, November 2000.

Dr. Tustison ran the software to perform the evaluation.

**B. Books and/or Chapters**

1. Min Chen, **Nicholas J. Tustison**, Rohit Jena, and James C. Gee:   
   Image Registration: Fundamentals and Recent Advances Based on Deep Learning. Machine Learning for Brain Disorder. Olivier Colliot (ed.). New York, NY: Humana Press, 2023.
2. Brian B. Avants and **Nicholas J. Tustison**: Mapping the Spatial Distribution of Lesions in Stroke: Effect of Diffeomorphic Registration Strategy in the ATLAS Dataset. Lesion-to-symptom mapping: principles and tools. Dorian Pustina and Daniel Mirman (eds.). New York, NY: Humana Press, 2022.
3. **Nicholas J. Tustison** and Amir A. Amini: Analysis of 4-D Cardiac MR Data with NURBS Deformable Models: Temporal Fitting Strategy and Nonrigid Registration. Parametric and Geometric Deformable Models: An Application in Biomaterials and Medical Imagery. Jasjit S. Suri and Aly Farag (eds.). Springer Publishers, II, May 2007.
4. **Health Ed/Videos, etc.**

N/A

1. **Short Communications**

N/A

1. **Abstracts**

N/A

1. **TECHNOLOGY TRANSFER ACTIVITY**
   1. **Inventions:**

N/A

* 1. **Registered Copyrighted Materials:**

N/A

# Licensing Activity:

N/A

# Other:

N/A

# INVITED LECTURES AND SYMPOSIUM

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| --- | --- | --- | --- |
| ANTsX for Developmental Biology | Prof. Murat Maga | Seattle Children’s Research Institute | 2025 |
| An Introduction to the ANTsX ecosystem through R | Statistical Methods in Imaging | University of Minnesota | 2023 |
| ANTsX Discussion | Prof. Richard Leahy | University of Southern California | 2022 |
| Open Code: Myths Debunked | Organization for Human Brain Mapping | Glasgow, Scotland | 2022 |
| ANTs Tutorial | PennSIVE | University of Pennsylvania | 2022 |
| ANTs lecture | Prof. Ipek Oguz | Vanderbuilt University | 2020 |
| Collaborative Case Study | Statistical Methods in Imaging | University of California, Irvine | 2019 |
| Intro to the ANTsX Ecosystem | ICERM | Brown University | 2019 |
| ANTsR Introduction | ENIGMA Consortium | Imaging Genetics Center, USC |  |
| ANTs Workshop | Prof. Hongtu Zhu | MD Anderson | 2016 |
| ANTs hands-on event | Baylor University | Baylor University | 2015 |
| SimpleITK | MICCAI Tutorial | Munich, Germany | 2015 |
| ANTs Workshop | CREATE-MIA at McGill University | McGill University | 2015 |
| Open-source tools in imaging | SPIE Workshop | SPIE Medical Imaging, San Diego | 2015 |

1. **COMMUNITY**

N/A