Sarang C. Joshi
Curriculum Vitae

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Education

1990	B.Sc.	Department of Electrical Engineering, Washington University in St. Louis
1993	M.Sc.	Department of Electrical Engineering, Washington University in St. Louis
1998	D.Sc.	Department of Electrical Engineering, Washington University in St. Louis

Curent Position

Professor, Department of Biomedical Engineering
Adjunct Professor, Department of Radiation Oncology
Adjunct Professor, School of Computing
Adjunct Professor, Department of Mathematics
Associate Director, Computational Oncology Research Initiative
University of Utah, Salt Lake City, UT

Previous Positions Held

06/2014-07/2018	Associate Director, Scientific Computing and Imaging Institute
08/2006-07/2015	Associate Professor, Department of Bioengineering, Adjunct Associate Professor, Department of Radiation Oncology, University of Utah, Salt Lake City, UT
07/2005-07/2006	Visiting Scientist, German Cancer Research Center (DKFZ), Heidelberg Germany
06/2001-07/2012	Founder and Board Member, Morphormics Inc. North Carolina. (Acquired by Accuray, NASDAQ: ARAY)
07/2000-07/2006	Assistant Professor Department of Radiation Oncology Assistant Professor Biomedical Engineering, Adjunct Assistant Professor Department of Computer Science, University of North Carolina at Chapel Hill, Chapel Hill NC.
05/1999-06/2000	Research Fellow, Center for Imaging Science Johns Hopkins University, Baltimore, MD.
03/1999-05/2000	Director of Technology Development, Medtronic, Broomfield, CO.
05/1997-03/1999	Director of Software Applications, IntellX L.L.C. Broomfield, CO. (Acquired by Medtronic NYSE:MDT)

Honors and Awards

1995	Washington University, NCR Stake holders award
2007	ICCV David Marr Best Paper Award
2010	The international journal Signal Processing Most cited paper Award
2010	MICCAI Best of the Journal Issue Award
2011	NIH/NIBIB Edward C. Nagy Investigator Award
2011	ACM Eurographics Symposium Best Paper Award
2013	ISBI Best Paper Award
2021	IPMI Erbsmann Prize (Best Paper Award)

Patents

1. Method and Apparatus for Image Registration, U.S Patent#6009212, Filed July 10, 1996, Issued December 28, 1999

2. Method and apparatus for automatic shape characterization, U.S Patent#6611630, Filed Jul 10, 1996, Issued August 26, 2003

3. Method and apparatus for image registration using large deformation diffeomorphisms on a sphere, U.S Patent#6633686, Filed September 20, 2000, Issued October 14, 2003

4. Method and apparatus for processing images with regions representing target objects, U.S Patent#6754374, Filed December 16, 1999, Issued June 22, 2004

5. Method and apparatus for image registration, U.S Patent#6553152, Filed April 27, 1999, Issued April 22, 2003

6. Rapid convolution based large deformation image matching via landmark and volume imagery, U.S Patent#6408107, Filed November 14, 2000, Issued June 18, 2002

7. Rapid convolution based large deformation image matching via landmark and volume imagery, U.S Patent#6226418, Filed November 5, 1998, Issued May 1, 2001

8. Methods and systems for modeling objects and object image data using medial atoms, U.S Patent#7200251, Filed September 27, 2002, Issued April 3, 2007

9. Method and system for using computed tomography to test pulmonary function, U.S Patent#7668357, Filed October 17, 2005, Issued February 23, 2010

10. Method and system for tracking objects using radio tomographic imaging, U.S Patent#8502728, Filed September 11, 2009, Issued August 6, 2013

11. Image reconstruction incorporating organ motion, U.S Patent#8824756, Filed June 30, 2010, Issued September 2, 2014

Graduate Student Supervision

Current Doctoral Students

1. Amanpreet Singh, Research Advisor and Committee Chair, School of Computing, University of Utah.

2. Haocheng Dai, Research Advisor and Committee Chair, School of Computing, University of Utah.

3. Mingzhen Shao, Research Advisor and Committee Chair, School of Computing, University of Utah.

4. Estelle Trieu, Research Advisor and Committee Chair, School of Computing, University of Utah.

Previously Mentored Doctoral Students

1. Kris Campbell, PhD December 2021, Co-Research Advisor and Committee Chair, School of Computing, University of Utah,"Metric Methods for Shape Analysis of Cortical Functional Regions, Subcortical Structures, and Structural Connectomes."

2. Markus Foote, PhD December 2020, Research Advisor and Committee Chair, Department of Bioengineering, University of Utah,"Image analysis in global health: application to greenhouse gas monitoring and radiotherapy motion management."

3. Blake Zimmerman, PhD December 2020, Research Advisor and Committee Chair, Department of Bioengineering, University of Utah, Dissertation title:"Improving treatment assessment of magnetic resonance guided focused ultrasound."

4. Sam Preston, PhD December 2017, Co-Research Advisor, School of Computing, University of Utah, Dissertation title: "Modeling Nondiffeomorphic Motion via Composite Deformation Models".

5. Caleb Rotman, PhD August 2016, Research Advisor and Committee Chair, Department of Bioengineering, University of Utah, Dissertation title: "Motion Estimation in Computed Tomogrpahy"

6. Jacob Hinkle, PhD August 2013, Research Advisor and Committee Chair, Department of Bioengineering, University of Utah, Dissertation title: "The Quantitative Study of Changes in Anatomy"

7. Nikhil Singh, PhD October 2013, Co-Research Advisor, School of Computing University of Utah,Dissertation title: "Multivariate Regression of Shapes via Deformation Momenta: Application to Quantifying Brain Atropy in Aging and Dementia"

8. Linh Ha, PhD May 2011, Co-Research Advisor, School of Computing University of Utah, Dissertation title: "High Performance Multi-scale image processing framework on multiGPUs with applications to unbiased diffeomorphic atlas construction"

9. Brad Davis, PhD May 2008, Research Advisor and Committee Chair Department of Computer Science University of North Carolina, Dissertation title:"Medical Image Analysis via Frchet Means of Diffeomorphisms" (Winner of UNC Linda Dykstra Distinguished Dissertation Award)

10. Peter Lorenzen, May 2006, Research Advisor and Committee Chair Department of Computer Science University of North Carolina at Chapel Hill,Dissertation title: "Multi-Modal Image Set Registration and Atlas Formation"

11. P. TomasFletcher, August 2004, Co-Research Advisor Dept. of Computer Science University of North Carolina at Chapel Hill, Dissertation title:"Statistical Variability in Nonlinear Spaces: Application to Shape Analysis and DT-MRI"

Previously Mentored Masters Students

1. Kyle Scott Anderson, M.Sc June 2020, Department of Bioengineering, University of Utah.

2. Ben Larson, M.Sc. June 2016, School of Computing, University of Utah.

3. Ben Galvin, M.Sc. May 2015, Department of Bioengineering, University of Utah

4. Alton Alexander M.Sc. May 2012, Department of Bioengineering, University of Utah

5. Manjari I. Rao, M.Sc. July 2003, Department of Computer Science University of North Carolina at Chapel Hill

6. Leslie Nicole Levine Willis M.Sc. August 2002, Department of Computer Science University of North Carolina at Chapel Hill

External International Ph.D. Examiner

1. Stefan Sommer, Ph.D. 2012, Department of Computer Science, University of Copenhagen, Dissertation Title: "Non-linear Modeling of Deformation and Shape for Medical Imaging".

2. Nicolas Charon, Ph.D 2013, Department of Applied Mathematics, ENS Cachan, Dissertation Title: "Analysis of geometric and functional shapes with extensions of currents: Applications to registration and atlas estimation".

3. Lars Lau Raket, Ph.D 2014, University of Copenhagen, Department of Computer Science, Dissertation Title: "Statistical methods for functional data and computer vision".

4. Nina Miolane, PhD 2016, University of Nice-Sophia Antipolis, Department of Computer Science, Dissertation Title: "Geometric statistics for Computational Anatomy"

5. Pierre Roussillon, Ph.D 2017, Universit Paris Descartes, laboratoire MAP5, Dissertation Title: "Modles de cycles normaux pour lanalyse des dformations".

6. Shuman Jia, Ph.D 2019,University of Nice-Sophia Antipolis, Department of Computer Science, Dissertation Title: "Population-Based Models of Shape, Structure and Deformation in Atrial Fibrillation".

Post Doctoral Mentoring

1. 01/2021-toPresent, Kris Campbell, Scientific Computing and Imaging Institute Post Doctoral Fellow.

2. 01/2014-12/2014, Nicolas Charon, Post-doctoral research fellow, University of Copenhagen, Dr. Charon is now an Assistant Professor, Department of Applied Mathematics, Johns Hopkins University.

3. 2010-2011, Stanley Durrleman, Scientific Computing and Imaging Institute Post Doctoral Fellow. Dr Durrleman is now INRIA Researcher at Brain and Spine Institute (ICM - Cogimage group) within the Pitie Salpetriere Hospital, Paris, France.

4. 2006-2008, P. Thomas Fletcher, School of Computing and Scientific Computing and Imaging, Research Assistant Professor. Dr. Fletcher is now Associate Professor, Electrical and Computer Engineering University of Virgina.

5. 2007-2009, Sarah Geneser, Scientific Computing and Imaging Institute Post Doctoral Fellow. Dr. Geneser is now Assistant Professor at University of Washington, Department of Radiation Oncology.

6. 2003-2006, Mark Foskey, Department of Radiation Oncology, University of North Carolina at Chapel Hill, Research Assistant Professor, Dr. Foskey is now at Accuray.

Courses Taught

1. Bioen/CS 6640: Introduction to Image Processing.

2. Bioen 3070/5070: Statistics for Bioengineer.

3. Bioen 6500: Mathematics of Imaging.

4. Bioen 3301: Computational Methods for Bioengineers.

University Service

1. 2006-2010 Member SCI IT Futures Committee.

2. 2015-Present Department of Bioengineering Scholarship Committee (Chair from 2006-2015).

3. 2016 HCI 2025 Strategic Planning Working Group (WG 12)-Cancer Imaging

4. 2006-2010 College of Engineering Math Committee

5. 2007-2014 Department of Radiation Oncology RPT Committee.

6. 2012-2015 College of Engineering, College Council.

7. 2006-Present Department of Bioengineering, Undergraduate Curriculum Committee.

8. 2014-2015 Department of Bioengineering, RPT procedures Committee.

9. 2016-Present Department of Bioengineering, RPT Committee.

10. 2017-Present Department of Bioengineering, Chair of ByLaws Committee.

11. 2020 Scientific Computing and Imaging, Member of Director Search Committee.

12. 2021 Department of Radiation Oncology, Member of Chair Search Committee.

13. 2022 Scientific Computing and Imaging, Chair Imaging Faculty Search Committee.

Professional Activities

Editorial Boards

2006-2009 Medical Image Analysis
2013 IJCV Guest Editor Special Issue on Mathematical Foundations of Computational Anatomy

Journal Reviewer:

1. International Journal of Radiation Oncology, Biology and Physics

2. Medical Image Analysis

3. IEEE-Transactions on Medical Imaging

4. Journal of Mathematical Imaging and Vision

5. Neuroimage

6. Medical Physics

7. International Journal of Computer Vision

8. Journal of the Royal Statistical Society

9. Physics in Medicine and Biology

10. SIAM Imaging Science

Conference program committees

1. Workshop on Biomedical Image Registration

2. IEEE International Symposium on Biomedical Imaging

3. Medical Image Computing and Computer Assisted Intervention

4. Information Processing in Medical Imaging

5. Mathematical Methods in Biomedical Image Analysis

Workshop/Conference Organizer

2006 International Workshop on Mathematical Foundations of Computational Anatomy
2008 International Workshop on Mathematical Foundations of Computational Anatomy
2009 Probabilistic Models for Medical Image Analysis
2011 International Workshop on Mathematical Foundations of Computational Anatomy
2013 International Workshop on Mathematical Foundations of Computational Anatomy
2013 General Co-Chair, Information Processing in Medical Imaging (IPMI)
2015 International Workshop on Mathematical Foundations of Computational Anatomy
2017 International Workshop on Mathematical Foundations of Computational Anatomy
2019 International Workshop on Mathematical Foundations of Computational Anatomy

Selected NIH Review Panels

1. Chartered Member(2019-2022): Emerging Imaging Technologies in Neuroscience

2. Shared Instrumentation: NCRR High End Grant Program,ZRG1 ETTN-L (30) I

3. Neuroscience and Ophthalmic Technologies Study Section,2012/05 NOIT

4. Human Brain project Study Section Committee ZRG1 MDCN-G (55), MDCN-K (55)

5. NLM Visible Human Project Scope and Scale of the future 2007,

6. NIBIB Technology Development for Image guided Intervention NIBIB 06-003 RFA.

International Review Panels

1. High level expert panel at the National Research Fund of Luxembourg for PEARL: Program Excellent Award for Research in Luxembourg.

2. European Research Council external referee.

Research

Research Interest

My research focus over the past decade has been in the development of mathematical and computational tools in the fields of Medical Image Analysis, Statistical Machine Learning and Computer Vision. I have made significant contributions in 1) developing theoretical foundations, 2) the application of theory for the improved medical treatment, diagnosis and understanding of disease and 3) translating research to practical clinical tools that are integrated in to routine medical treatment.

Research Funding

I have acquired as a PI or a Co-PI a total of over $10,000,000.00 in external research grants funding. I have further participated as a senior investigator in externally funded research programs totaling over $35,000,000.00.

Current Research Grants

1. A tissue viability imaging biomarker for use in non-invasive breast cancer therapy, NIH/NSF R01CA259686, Role Principal Investigator (MPI with Allison Payne), Total $2952365.00, Start/End Dates:02/10/2022 - 01/31/2027

2. The Space of Riemannian Metrics for the Statistical Analysis of the Human Connectome, NSF/CRCNS DMS1912030, Role Principal Investigator, Total $650,000.00 Start/End Dates: 06/01/19 - 05/31/22

3. Validation and Translation of a Non-Invasive, MR-Guided Breast Cancer Therapy, NIH5R01MH100635 , Role Co-Investigator (PI. Allison Payne, U of Utah), Total $3,228,271.00 Start/End Dates: 02/01/18 - 01/31/23

Completed Research Grants

2019-2020	Multi-tiered Carbon Monitoring System, NASA, Role Co-Investigator (PI. Riley M. Duren, University of Arizona and JPL) Total	$1,472,705.00,
2017-2019	Improved Trace Gas Plume Detection using Indian and US AVIRIS-NG Data, NASA, Role Co-PI with Phillip Dennison,	$149,955.00
2014-2019	Multiscale Genetic Connectivity of Primate Social Circuits NIH 1R01MH100635 (MPI) Role PI: Sarang Joshi, & Julie Korenberg	$3,703,387.00

2013-2018	Personalized Motion Management for truly 4D Lung Stereotactic Body Radiotherapy, NIH R01 CA169102-01A13, PI: Amit Sawant (University of Maryland Prime), Role Utah PI,	$3,322,274.00
2013-2016	Rapid high order diffusion imaging for stroke, NIH R01 NS083761, PI: Edward Di Bella, Role: Investigator,	$2,112,884.00
2009-2016	Noise and Dose Reduction Methods, Ongoing research contract since 2009 , GE Medical Systems, Role Co-PI Sarang Joshi,	$1107460.00
2008-2013	Resource for MRI of Neurodegenerative Disorders, 1P41RR023953 Role: PI Image Processing Core, Project PI Mike Winer.	$6,037,721.00
2008-2013	Online Tools for Customizable ADNI Atlases Technology and Application, NIH R01EB007688 PI:Sarang Joshi.	$1,843,375.00
2009-2011	A Service-Oriented Architecture for The Computation, Visualization, and Management of Scientific Data, NSF IIS-0751152 Role: Co-PI, PI: Claudio Silvia.	$516,000.00
2008-2013	Atlas-Based Structural Models of the Mouse Myocardium, NIH 1R01HL092055 Role: Investigator PI: Edward Hsu	$1,878,750.00
2011-2013	Compressed Sensing with Motion Models for MRI of Late Gadolinium Enhancement, NIH 1R21HL110059 Role: Investigator, PI: Ed Dibella.	$373,750.00
2009-2011	Supplement to University of Utah Clinical and Translational Science, NIH 3UL1RR025764, Role: Investigator, PI Donald McClain.	$985,772.00
2003-2005	Automatic Organ Localization for Adaptive Radiation Therapy for Prostate Cancer: US Army Medical Research DAMD17-03-1-0134, PI Sarang Joshi.	$514,572.00
2003-2008	Planning Research Platform for Radiotherapy Simulation, NIH/NCI RO1 RR018615, Role: Investigator, PI: Ed Chaney.	$2,792,429.00
2002-2007	Medical Image Presentation: NIH: PO1 CA47982, Role: Investigator, PI: Stephen Pizer.	$7,368,598.00
2002-2007	Prospective Studies of the Pathogenesis of Schizophrenia: NIH/NIMH: P50 MH064065-01A1, Role: Investigator, PI: Jeffrey Lieberman.	$10,753,585.00
2002-2007	Longitudinal MRI Study of Brain Development in Fragile X: NIH R01-MH64708, Role Investigator, PI: Joseph Piven.	$3,448,777.00
2002-2008	3D Cerebral Vessel Location for Surgical Planning: NIH: 2R01 CA67812, Role: Investigator, PI: Liz Bullit.	$2,531,873.00

Selected Invited Talks

1. *Statistics of Shape: Simple Statistics on Interesting Spaces*, Mathematics in Brain Imaging, IPAM, University of California, Los Angels 2004.

2. *Image Registration and Computational Anatomy in Radiation Therapy*, Memorial Session in Honor of Hideo Kubo, AAPM Annual Meeting, 2004

3. *Towards 4D IMRT*, Presidential Symposium ASTRO Annual Meeting, 2005

4. *Computational Anatomy: Simple Statistics on Interesting Spaces*, IMA Workshop Shape Spaces, 2006

5. *Computational Anatomy: Simple Statistics on Interesting Spaces*, Random Shapes, IPAM, University of California, Los Angels 2007

6. *Simple statistics on Interesting Spaces: Regression Analysis on Manifolds for Computational Anatomy*, Workshop Statistical Registration: Pair-wise and Group-wise Alignment and Atlas Formation, MICCAI 2007

7. *Morphometric Analysis: Registration, Segmentation & Atlases*, Advanced Topics in Analysis of Structural and Functional MRI Data, ISMRM 2008

8. *Computational Anatomy: Simple Statistics on Interesting Spaces*, Hausodorff Research institute of Mathematics, University of Bonn, June 2008

9. *Statistics of Shape: Simple Statistics on Interesting Spaces*, Mathematics in Brain Imaging, IPAM, University of California, Los Angels July 2008.

10. *Computational Anatomy: Simple Statistics on Interesting Spaces*, MICCAI Workshop on Manifold Learning, September 2008.

11. *Computational Anatomy: Simple Statistics on Interesting Spaces*, Athinoula A. Martinos Center for Biomedical Imaging, Harvard-Massachusetts Institute of Technology (MIT) Division of Health Sciences & Technology (HST), September 2008.

12. *Statistics of shape: Simple statistics on interesting spaces,*Random Fields and Stochastic Geometry, Banff International Research Station for Mathematical Innovation and Discovery, February 2009.

13. *Multivariate Statistical Analysis of Deformation Momenta Relating Anatomical Shape to Neuropsychology*, Analysis of Object Data, SAMSI, September 2010

14. *Multivariate Statistical Analysis of Deformation Momenta Relating Anatomical Shape to Neuropsychology* Workshop on Computational Anatomy and mathematics on shape spaces - Imperial College, May 2010.

15. *Optimal data-driven sparse parameterization of diffeomorphisms for population analysis*, Geometry for Anatomy, Banff International Research Station for Mathematical Innovation and Discovery, August 2011

16. *Analyzing the Changing Anatomy*, ICM Distinguished Seminar Series, Johns Hopkins University, February 2012

17. *Computational Anatomy: Simple Statistics on Interesting Spaces*, Imperial Collage, London, February 2014

18. *Computational Anatomy: Simple Statistics on Interesting Spaces*, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Linz, October 2014

19. *Analyzing the Changing Anatomy*, Erwin Schrödinger International Institute for Mathematical Physics: Program on Infinite-dimensional Riemannian geometry with applications to image matching and shape analysis, Vienna Austria, February 2015

20. *Weighted Diffeomorphic Density Matching with Applications to Thoracic Image Registration*, National University of Singapore, Institute for Mathematical Sciences, July 2016

21. *Motion Modeling in CT Imaging*, Workshop on Uncertainty in Image Reconstruction, Technical University of Denmark, December 2016

22. *Metric Estimation on Landmark Manifolds*, Mathematical Research Institute of Oberwolfach, Workshop on Applications-Driven Geometric Functional Data Analysis, October 2017

23. *Bridge Simulation and Metric Estimation on Lie Groups and Orbit Spaces*, Isaac Newton Institute for Mathematical Sciences, Workshop on Shape analysis and computational anatomy, November 2017

Publications

Since 1993 I have co-authored over 70 refereed journal papers and over 100 conference proceedings. I have a Google Scholar h-index of 62 and a i10-index of 139. I have over 30 publications with over 100 citations, 5 publications with over 500 citations, and publication with over 1000 citations.

Books

1. J. C. Gee, S. Joshi, K. M. Pohl, W. M. Wells, and L. Zöllei. *Information Processing in Medical Imaging: 23rd International Conference, IPMI 2013, Asilomar, CA, USA, June 28–July 3, 2013, Proceedings*. Vol. 7917. Springer, 2013.
2. X. Pennec and S. Joshi. *Proceedings of the First International Workshop on Mathematical Foundations of Computational Anatomy (MFCA'06)-Geometrical and Statistical Methods for Modelling Biological Shape Variability*. MICCAI-Inria, 2006.

Book chapters

1. M. Bauer, S. Joshi, and K. Modin. "Diffeomorphic density registration". In: *Riemannian Geometric Statistics in Medical Image Analysis*. Academic Press, 2020, pp. 577–603.
2. L. Ha, J. Krüger, S. Joshi, and C. T. Silva. "Multi-scale unbiased diffeomorphic atlas construction on multi-GPUs". In: *GPU Computing Gems*. 2010, pp. 771–791.
3. S. Pizer, Q. Han, S. Joshi, P. T. Fletcher, P. A. Yushkevich, and A. Thall. "Synthesis, deformation, and statistics of 3D objects via m-reps". In: *Medial Representations*. Springer Netherlands, 2008, pp. 241–266.
4. P. T. Fletcher, S. M. Pizer, and S. C. Joshi. "Shape variation of medial axis representations via principal geodesic analysis on symmetric spaces". In: *Statistics and Analysis of Shapes*. Birkhäuser Boston, 2006, pp. 29–59.
5. H. Guo, A. Rangarajan, and S. Joshi. "Diffeomorphic point matching". In: *Handbook of Mathematical Models in Computer Vision*. Springer US, 2006, pp. 205–219.
6. M. I. Miller, S. C. Joshi, and G. E. Christensen. "Large deformation fluid diffeomorphisms for landmark and image matching". In: *Brain Warping*. New York: Academic, 1999, pp. 115–131.
7. M. Miller, S. Joshi, D. Maffitt, J. McNally, and U. Grenander. "Membranes, Mitochondria, and Amoebae: 1, 2, and 3 Dimensional Shape Models". In: *Advances in Applied Statistics:Statistics and Images: 2*. Ed. by K. Mardia. Carfax, 1994.

Refereed Journal papers

1. H. Dai, M. Penwarden, R. M. Kirby, and S. Joshi. Neural Operator Learning for Ultrasound Tomography Inversion. *arXiv preprint arXiv:2304.03297* (2023).
2. H. Dai, V. Sarkar, C. Dial, M. Foote, S. Joshi, and B. J. Salter. High Fidelity, CT on Rails-based Characterization of Total Delivered Dose Variation for Conformal Head and Neck Treatment: With evaluation of adaptive replanning time-point implications. *medRxiv* (2023), pp.2023–04.
3. S. Johnson, B. Zimmerman, H. Odéen, J. Shea, N. Winkler, R. Factor, S. Joshi, and A. Payne. A non-contrast multi-parametric MRI biomarker for assessment of MR-guided focused ultrasound thermal therapies. *IEEE Transactions on Biomedical Engineering* (2023).
4. S. Saha, S. Joshi, and R. Whitaker. Matching aggregate posteriors in the variational autoencoder. *arXiv preprint arXiv:2311.07693* (2023).
5. K. M. Campbell, H. Dai, Z. Su, M. Bauer, P. T. Fletcher, and S. C. Joshi. Integrated Construction of Multimodal Atlases with Structural Connectomes in the Space of Riemannian Metrics. *The journal of machine learning for biomedical imaging* vol. **1** (2022).

6. H. Dai, M. Bauer, P. T. Fletcher, and S. C. Joshi. Deep Learning the Shape of the Brain Connectome. *arXiv preprint arXiv:2203.06122* (2022).

7. M. H. Jensen, S. Joshi, and S. Sommer. Discrete-Time Observations of Brownian Motion on Lie Groups and Homogeneous Spaces: Sampling and Metric Estimation. *Algorithms* vol. **15**(8) (2022), pp.290.

8. K. M. Campbell, H. Dai, Z. Su, M. Bauer, P. T. Fletcher, and S. C. Joshi. Integrated Construction of Multimodal Atlases with Structural Connectomes in the Space of Riemannian Metrics. *arXiv preprint arXiv:2109.09808* (2021).

9. M. D. Foote, P. E. Dennison, P. R. Sullivan, K. B. O'Neill, A. K. Thorpe, D. R. Thompson, D. H. Cusworth, R. Duren, and S. C. Joshi. Impact of scene-specific enhancement spectra on matched filter greenhouse gas retrievals from imaging spectroscopy. *Remote Sensing of Environment* vol. **264** (2021), pp.112574.

10. M. Højgaard Jensen, L. Hilgendorf, S. Joshi, and S. Sommer. Bridge Simulation on Lie Groups and Homogeneous Spaces with Application to Parameter Estimation. *arXiv e-prints* (2021), pp.arXiv–2112.

11. B. E. Zimmerman, S. L. Johnson, H. A. Odéen, J. E. Shea, R. E. Factor, S. C. Joshi, and A. H. Payne. Histology to 3D in vivo MR registration for volumetric evaluation of MRgFUS treatment assessment biomarkers. *Scientific Reports* vol. **11**(1) (2021), pp.18923.

12. D. R. Thompson, S. Jongaramrungruang, C. Frankenberg, and S. C. Joshi. Fast and Accurate Retrieval of Methane Concentration from Imaging Spectrometer Data Using Sparsity Prior (2020).

13. B. Zimmerman, S. Johnson, H. Odeen, J. Shea, M. Foote, N. Winkler, S. Joshi, and A. Payne. Learning Multiparametric Biomarkers for Assessing MR-Guided Focused Ultrasound Treatments. *IEEE Transactions on Bio-medical Engineering* (2020).

14. M. Bauer, S. Joshi, and K. Modin. Diffeomorphic random sampling using optimal information transport. In: *International Conference on Geometric Science of Information*. Springer, Cham. 2017, pp. 135–142.

15. M. Bauer, S. Joshi, and K. Modin. On geodesic completeness for Riemannian metrics on smooth probability densities. *Calculus of Variations and Partial Differential Equations* vol. **56**(4) (July 2017), pp.113. ISSN: 1432-0835.

16. P. Sabouri, M. Foote, M. Ranjbar, M. Tajdini, S. Mossahebi, S. Joshi, and A. Sawant. a Novel Method Using Surface Monitoring to Capture Breathing-induced Cycle-to-cycle Variations with 4dct: th-ef-605-10. *Medical Physics* vol. **44**(6) (2017), pp.3312–3313.

17. S. Sommer, A. Arnaudon, L. Kuhnel, and S. Joshi. Bridge Simulation and Metric Estimation on Landmark Manifolds. *arXiv preprint arXiv:1705.10943* (2017).

18. N. Singh, J. Hinkle, S. Joshi, and P. T. Fletcher. Hierarchical geodesic models in diffeomorphisms. *International Journal of Computer Vision* vol. **117**(1) (2016), pp.70–92.

19. M. Bauer, S. Joshi, and K. Modin. Diffeomorphic density matching by optimal information transport. *SIAM Journal on Imaging Sciences* vol. **8**(3) (2015), pp.1718–1751.

20. V. A. Cardenas, D. Tosun, L. L. Chao, P. T. Fletcher, S. Joshi, M. W. Weiner, and N. Schuff. Voxel-Wise Co-analysis of Macro-and Microstructural Brain Alteration in Mild Cognitive Impairment and Alzheimer's Disease Using Anatomical and Diffusion MRI. *Journal of Neuroimaging* vol. **24**(5) (2014), pp.435–443.

21. S. Durrleman, M. Prastawa, N. Charon, J. R. Korenberg, S. Joshi, G. Gerig, and A. Trouvé. Morphometry of anatomical shape complexes with dense deformations and sparse parameters. *NeuroImage* vol. **101** (2014), pp.35–49.

22. J. Hinkle, P. T. Fletcher, and S. Joshi. Intrinsic polynomials for regression on Riemannian manifolds. *Journal of Mathematical Imaging and Vision* vol. **50**(1-2) (2014), pp.32–52.

23. N. Singh, P. T. Fletcher, J. S. Preston, R. D. King, J. Marron, M. W. Weiner, S. Joshi, A. D. N. I. (ADNI, et al. Quantifying anatomical shape variations in neurological disorders. *Medical image analysis* vol. **18**(3) (2014), pp.616–633.

24. D. Tosun, S. Joshi, and M. W. Weiner. Multimodal MRI-based imputation of the Aβ+ in early mild cognitive impairment. *Annals of clinical and translational neurology* vol. **1**(3) (2014), pp.160–170.

25. S. Durrleman, S. Allassonnière, and S. Joshi. Sparse adaptive parameterization of variability in image ensembles. *International Journal of Computer Vision* vol. **101**(1) (2013), pp.161–183.

26. D. Tosun, S. Joshi, and M. W. Weiner. Neuroimaging predictors of brain amyloidosis in mild cognitive impairment. *Annals of neurology* vol. **74**(2) (2013), pp.188–198.

27. L. K. Ha, J. Krüger, J. L. D. Comba, C. T. Silva, and S. Joshi. Isp: An optimal out-of-core image-set processing streaming architecture for parallel heterogeneous systems. *Visualization and Computer Graphics, IEEE Transactions on* vol. **18**(6) (2012), pp.838–851.

28. J. Hinkle, M. Szegedi, B. Wang, B. Salter, and S. Joshi. 4D CT image reconstruction with diffeomorphic motion model. *Medical image analysis* vol. **16**(6) (2012), pp.1307–1316.

29. V. Sarkar, B. Wang, J. Hinkle, V. J. Gonzalez, Y. J. Hitchcock, P. Rassiah-Szegedi, S. Joshi, and B. J. Salter. Dosimetric evaluation of a virtual image-guidance alternative to explicit 6 degree of freedom robotic couch correction. *Practical radiation oncology* vol. **2**(2) (2012), pp.122–137.

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