

## Suyash P. Awate

Asha and Keshav Bhide Chair Professor  
 Computer Science and Engineering (CSE) Department,  
 Indian Institute of Technology (IIT) Bombay, Mumbai  
[www.cse.iitb.ac.in/~suyash](http://www.cse.iitb.ac.in/~suyash)

### Research Areas

Image processing and analysis, [Medical image computing](#), Machine learning, Computer vision, Statistical modeling and inference

### Positions Held

- 2023 – present *Indian Institute of Technology (IIT) Bombay, Department of Computer Science and Engineering*  
 Asha and Keshav Bhide Chair Professor
- 2021 – present *Indian Institute of Technology (IIT) Bombay, Department of Computer Science and Engineering*  
 Professor
- 2015 – 2021 *Indian Institute of Technology (IIT) Bombay, Department of Computer Science and Engineering*  
 Associate Professor
- 2013 – 2015 *Indian Institute of Technology (IIT) Bombay, Department of Computer Science and Engineering*  
 Assistant Professor
- 2013 – 2017 *University of Utah, School of Computing*  
 Adjunct Faculty
- 2010 – 2013 *University of Utah, School of Computing*  
 Research Assistant Professor
- University of Utah, Scientific Computing and Imaging (SCI) Institute*  
 Research Faculty
- 2009 – 2010 *Siemens Corporate Research, Medical Imaging Technologies*  
 Research Scientist
- 2006 – 2009 *University of Pennsylvania, Department of Radiology*  
 Postdoctoral Fellow at Penn Image Computing and Science Laboratory (PICSL)

### Honors, Awards

- 2023 “Excellence in Teaching Award” from Computer Science and Engineering Dept. at IITB
- 2022 “Best Paper Award” at IEEE Int. Symp. Biomedical Imaging (ISBI) conference
- 2022 Keynote Talk at MICCAI Int. Conf. Workshop on Computational Diffusion MRI (CDMRI)
- 2020 “Magna Cum Laude Award” at ISMRM international conference
- 2019 “Best Paper Award” finalist at IEEE Int. Symp. Biomedical Imaging (ISBI) conference
- 2019 First podium presentation at IPMI international conference
- 2018 “Young Scientist Award” runner-up at MICCAI international conference
- 2017 “Best Paper Award” finalist at IEEE Int. Conf. on Image Processing (ICIP)
- 2017 International Travel Support Grant, Department of Science and Technology, Govt. of India
- 2015 First podium presentation at IPMI international conference
- 2014 Microsoft Research India Young Faculty Award, Indian Institute of Technology Bombay
- 2013 “Best Paper Award” at MBIA workshop at MICCAI international conference
- 2012 “Best Paper Award” at MBIA workshop at MICCAI international conference
- 2009 “Young Scientist Award” runner-up at MICCAI international conference

2001	1 <sup>st</sup> rank in college (about 120 students), 8 <sup>th</sup> rank in university (about 2000 students), Distinction in each semester, University of Mumbai
1997–2001	Dhirubhai Ambani Undergraduate Merit Scholarship
1997–8	IIT Joint Entrance Exam ranks in top 2150 and 1150 from 150,000+ examinees in India
1997	National Merit Scholarship Scheme Certificate from the Government of India (Top 0.1% in All India Senior Secondary School Examination, Rank 4 in Maharashtra state)

## Refereed Journal Publications

*Elsevier MedIA, IEEE TMI, MELBA are the top journals for medical image analysis*

*NeuroImage is among the top journals for image-analysis-oriented brain research*

*IEEE TIP, Pattern Recognition, IEEE TPAMI are among the top journals for image analysis*

1. Sharma R, [Awate SP](#)  
[A semi-supervised multiscale generalized-VAE Framework for one-class classification](#)  
*Neurocomputing* 2025, 620:129172, Elsevier
2. Lekadir K et al. (including [Awate SP](#))  
[FUTURE-AI: international consensus guideline for trustworthy and deployable artificial intelligence in healthcare](#)  
*British Medical Journal (BMJ)* 2025, 388:e081554
3. Sharma V, [Awate SP](#)  
[Adversarial EM for variational deep learning: Application to semi-supervised image quality enhancement in low-dose PET and low-dose CT](#)  
*Medical Image Analysis (MedIA)* 2024, 97:103291, Elsevier
4. Gaikwad A, [Awate SP](#)  
[Deep Monte-Carlo EM for semantic segmentation using weakly-and-semi-supervised learning using very few expert segmentations](#)  
*Machine Learning for Biomedical Imaging (MELBA)* 2024, 2:717-760
5. Shah K<sup>^</sup>, Bhartia V<sup>^</sup>, Biswas C, Sahu A, Shetty P, Singh V, Velayutham P, [Awate SP\\*](#), Moiyadi A\*  
[Tumor location and neurocognitive function—unravelling the association and identifying relevant anatomical substrates in intra-axial brain tumors](#)  
*Neuro-Oncology Advances* 2024, 6(1):vdae020, Oxford Academic
6. Kulkarni P, Merchant SN, [Awate SP](#)  
[Mixed-dictionary models and variational inference in task fMRI for shorter scans and better image quality](#)  
*Medical Image Analysis (MedIA)* 2022, 78:102392, Elsevier
7. Sudarshan VP, Upadhyay U, Egan G, Chen Z, [Awate SP](#)  
[Towards lower-dose PET using physics-based uncertainty-aware multimodal learning with robustness to out-of-distribution data](#)  
*Medical Image Analysis (MedIA)* 2021, 102187, Elsevier
8. Kulkarni P, Merchant SN, [Awate SP](#)  
[Dictionary+wavelet model with nested-minorized VB-EM for SMS-CAIPI R-fMRI reconstruction](#)  
*IEEE Open J. Signal Processing (OJSP)* 2021, 2644-1322
9. Wadhvani K, [Awate SP](#)  
[Controllable image generation with semi-supervised deep learning and deformable-mean-template based geometry-appearance disentanglement](#)  
*Pattern Recognition* 2021, 118:108001, Elsevier
10. Sudarshan VP, Li S, Jamadar S, Egan G, [Awate SP](#), Chen Z  
[Incorporation of anatomical MRI knowledge for enhanced mapping of brain metabolism using](#)

## functional PET

*NeuroImage* 2021, 233:117928, Elsevier

11. Kulkarni P, Merchant SN, [Awate SP](#)  
R-fMRI reconstruction from k-t undersampled data using a subject-invariant dictionary model and VB-EM with nested minorization  
*Medical Image Analysis (MedIA)* 2020, 65:101752, Elsevier
12. Sudarshan VP, Egan G, Chen Z, [Awate SP](#)  
Joint PET-MRI image reconstruction using a patch-based joint-dictionary prior  
*Medical Image Analysis (MedIA)* 2020, 62:101669, Elsevier
13. Kumar N, [Awate SP](#)  
Semi-supervised robust mixture models in RKHS for abnormality detection in medical images  
*IEEE Trans. Image Processing (TIP)* 2020, 29: 4772-87
14. [Awate SP](#), Garg S, Jena R  
Estimating uncertainty in MRF-based image segmentation: A Perfect-MCMC approach  
*Medical Image Analysis (MedIA)* 2019, 55:181-196, Elsevier
15. Wu J, [Awate SP](#), Licht DJ, Clouchoux C, du Plessis AJ, Avants BB, Vossough A, Gee JC, Limperpolous C  
Assessment of MRI-based automated fetal cerebral cortical folding measures in prediction of gestational age in the third trimester  
*American Journal of Neuroradiology (AJNR)* 2015, 36(7):1379-74
16. [Awate SP](#), Whitaker RT  
Multiatlas segmentation as nonparametric regression  
*IEEE Trans. Medical Imaging (TMI)* 2014, 33(9):1803-1817
17. Liu W, [Awate SP](#), Anderson JS, Fletcher PT  
A functional networks estimation method of resting-state fMRI using a hierarchical Markov random field  
*NeuroImage* 2014, 100:520-534, Elsevier
18. Tustison N, [Awate SP](#), Song G, Cook T, Gee JC  
Point-set registration using Havrda-Charvat-Tsallis entropy measures  
*IEEE Trans. Medical Imaging (TMI)* 2011, 30(2):451-460
19. [Awate SP](#), Yushkevich P, Song Z, Licht DJ, Gee JC  
Cerebral cortical folding analysis with multivariate modeling and testing : studies on gender differences and neonatal development  
*NeuroImage* 2010, 53(2):450-459, Elsevier
20. Zhang H, [Awate SP](#), Das S, Woo J, Melhem E, Gee JC, Yushkevich P  
A tract-specific framework for white matter morphometry combining macroscopic and microscopic tract features  
*Medical Image Analysis (MedIA)* 2010, 14(5):666-673, Elsevier
21. Tustison N, [Awate SP](#), Altes T, Gee JC  
Pulmonary kinematics from tagged hyperpolarized Helium-3 MRI  
*J. Magnetic Resonance Imaging (JMRI)* 2010, 31(5):1236-1241, Wiley
22. Pluta J, Avants B, Glynn S, [Awate SP](#), Gee JC, Detre J  
Appearance and incomplete label matching for diffeomorphic template based hippocampus segmentation  
*Hippocampus* 2009, 19(6):565-571, Wiley
23. [Awate SP](#), Zhang H, Gee JC  
A fuzzy, nonparametric segmentation framework for DTI and MRI analysis: with applications to DTI-

[tract extraction](#)

*IEEE Trans. Medical Imaging (TMI)* 2007, 26(11):1525-1536

24. [Awate SP](#), Whitaker RT  
[Feature-preserving MRI denoising: a nonparametric empirical-Bayesian approach](#)  
*IEEE Trans. Medical Imaging (TMI)* 2007, 26(9):1242-1255
25. Adluru G, [Awate SP](#), Tasdizen T, Whitaker R, DiBella EVR  
Temporally constrained reconstruction of dynamic cardiac perfusion MRI  
*Magnetic Resonance in Medicine (MRM)* 2007, 57:1027-1036, Wiley
26. [Awate SP](#), Tasdizen T, Foster N, Whitaker RT  
[Adaptive Markov modeling for mutual-information-based unsupervised MRI brain-tissue classification](#)  
*Medical Image Analysis (MedIA)* 2006, 10(5):726-739, Elsevier  
(in top 8 most-cited papers in MedIA between 2006-2009)
27. [Awate SP](#), Whitaker RT  
[Unsupervised, information-theoretic, adaptive image filtering for image restoration](#)  
*IEEE Trans. Pattern Analysis and Machine Intelligence (TPAMI)* 2006, 28(3):364-376

## Refereed Full-Length Conference Publications

*MICCAI, IPMI, ISBI are the premier international conferences for medical image analysis*

28. Sharma V, [Awate SP](#)  
*Information Processing in Medical Imaging (IPMI)* 2025, xx-xx, Springer LNCS
29. Sharma V, Goyal A, [Awate SP](#)  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2025, xx-xx, IEEE Xplore  
**(podium presentation)**
30. Pal J, Saini H, Welling S, [Awate SP](#)  
*Winter Conf. on Applications of Computer Vision (WACV)* 2025: xx-xx, IEEE Xplore
31. Pal J, [Awate SP](#)  
Convex segments for convex objects using DNN boundary tracing and graduated optimization  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2024, (8)91-101  
Springer LNCS 15008  
**(acceptance rate 30%, awarded MICCAI RISE Registration Grant)**
32. Pal J, [Awate SP](#)  
A hard convex-shape constraint in DNNs for object segmentation  
*IEEE Int. Conf. Image Processing (ICIP)* 2024, 2074-2080, IEEE Xplore
33. Sharma V, [Awate SP](#)  
Adversarial EM for partially-supervised image-quality enhancement  
*IEEE Int. Conf. Image Processing (ICIP)* 2024, 4007-4013, IEEE Xplore  
**(podium presentation, acceptance rate 17%)**
34. Sharma R, Shi H, Cai J, [Awate SP](#), Birbilis N  
Deep semi-supervised anomaly detection using VQ-VAE  
*Digital Image Computing: Techniques and Applications (DICTA)* 2023, IEEE Xplore
35. Gaikwad A, Varma H, [Awate SP](#)  
Deep variational segmentation of topology-constrained object sets, with correlated uncertainty models, for robustness to degradations  
*IEEE Int. Conf. Image Processing (ICIP)* 2023, 2195-99, IEEE Xplore
36. Varma H, Gaikwad A, [Awate SP](#)  
Adversarial training with multiscale boundary-prediction DNN for robust topologically-constrained

- segmentation in OOD images  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2023, 1-5, IEEE Xplore*
37. Sharma V, Khurana A, Yenamandra S, Awate SP  
Semi-supervised deep expectation-maximization for low-dose PET-CT  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2022, 1-5, IEEE Xplore*  
**(Best Paper Award, podium presentation, double-blind review)**
  38. Sharma R, Awate SP  
Robust and uncertainty-aware VAE (RU-VAE) for one-class classification  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2022, 1-5, IEEE Xplore*
  39. Sharma R, Mashkaria S, Awate SP  
A semi-supervised generalized VAE framework for abnormality detection using one-class classification  
*Winter Conf. on Applications of Computer Vision (WACV) 2022: 1302-1310, IEEE Xplore*
  40. Gaikwad AV, Awate SP  
Deep MCEM for weakly-supervised learning to jointly segment and recognize objects using very few expert segmentations  
*Information Processing in Medical Imaging (IPMI) 2021, 624-36, Springer LNCS 12729*
  41. Yenamandra S, Khurana A, Jena R, Awate SP  
Learning image inpainting from incomplete images using self-supervision  
*IEEE Int. Conf. Pattern Recognition (ICPR) 2020, 10390-7*
  42. Taneja K, Kulkarni P, Merchant SN, Awate SP  
A Bayesian deep CNN framework for reconstructing k-t-undersampled resting-fMRI  
*IEEE Int. Conf. Pattern Recognition (ICPR) 2020, 8492-9*
  43. Pande N, Awate SP  
Generative deep-neural-network mixture modeling with semi-supervised MinMax+EM learning  
*IEEE Int. Conf. Pattern Recognition (ICPR) 2020, 5666-73*
  44. Shigwan S, Gaikwad AV, Awate SP  
Object segmentation with deep neural nets coupled with a shape prior, when learning from a training set of limited quality and small size  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2020, 1149-53*
  45. Kulkarni PH, Gupta K, Merchant SN, Awate SP  
R-fMRI reconstruction from k-t undersampled simultaneous-multislice MRI with controlled aliasing: towards higher spatial resolution  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2020, 1060-4*
  46. Upadhyay U, Awate SP  
A mixed-supervision multilevel GAN framework for image quality enhancement  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2019, (5) 556-64*  
Springer LNCS 11768  
**(MICCAI Undergraduate Student Travel Award)**
  47. Sudarshan VP, Gupta K, Egan G, Chen Z, Awate SP  
Joint reconstruction of PET + parallel-MRI in a Bayesian coupled-dictionary MRF framework  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2019, (3) 39-47*  
Springer LNCS 11766  
**(MICCAI Graduate Student Travel Award)**
  48. Jena R, Awate SP  
A Bayesian neural net to segment images with uncertainty estimates and good calibration  
*Information Processing in Medical Imaging (IPMI) 2019, 3-15, Springer LNCS 11492*  
**(first podium presentation of the conference, podium presentation, acceptance rate 11%)**

49. Radhakrishnan T, [Awate SP](#)  
A unified Bayesian approach to quantitative colocalization analysis with MRF-based Poissonian deconvolution and segmentation in dual-color fluorescence microscopy  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2019*, 543-7
50. Upadhyay U, [Awate SP](#)  
Robust super-resolution GAN, with manifold-based and perception loss  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2019*, 1372-6  
**(Best Paper Award finalist: in top 10 of eligible papers, podium presentation)**
51. Gupta K, [Awate SP](#)  
Bayesian reconstruction of undersampled multicoil HARDI  
*IEEE Int. Conf. Image Processing (ICIP) 2019*, 1247-51  
**(podium presentation)**
52. Gupta K, [Awate SP](#)  
Random forests for simultaneous-multislice (SMS) undersampled HARDI reconstruction and uncertainty estimation  
*IEEE Int. Conf. Image Processing (ICIP) 2019*, 2626-30
53. Kumar N, Chandran S, Rajwade A, [Awate SP](#)  
Semi-supervised robust one-class classification for abnormality detection in medical images  
*IEEE Int. Conf. Image Processing (ICIP) 2019*, 544-8
54. Shah M, Merchant SN, [Awate SP](#)  
MS-Net: Mixed-supervision fully-convolutional networks for full-resolution segmentation  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018*, 21(4):379-87  
**(Young Scientist Award runner-up: in top 10 of eligible papers, podium presentation, acceptance rate 5%, student travel award)**
55. Garg S, [Awate SP](#)  
Uncertainty estimation in segmentation with perfect MCMC sampling in Bayesian MRFs  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018*, 21(1):673-81  
(acceptance rate 34%)
56. Sudarshan VP, Chen Z, [Awate SP](#)  
Joint PET+MRI patch-based dictionary for Bayesian random field PET reconstruction  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2018*, 21(1):338-46  
(acceptance rate 34%)
57. Shah M, Merchant SN, [Awate SP](#)  
Abnormality detection using deep neural networks with robust autoencoding and semi-supervision  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2018*, 568-72  
**(podium presentation, acceptance rate 17%)**
58. Kulkarni PH, Merchant SN, [Awate SP](#)  
Bayesian reconstruction of R-fMRI from k-t undersampled data using a robust subject-invariant spatially-regularized dictionary prior  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2018*, 302-6
59. Radhakrishnan T, Reddy K, [Awate SP](#)  
Accurate colocalization estimation in multichannel fluorescence microscopy using a novel Bayesian graphical model and perfect Monte Carlo EM algorithm  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2018*, 1583-7  
**(podium presentation, acceptance rate 17%)**
60. Das R, Golatkar A, [Awate SP](#)  
Sparse kernel PCA for outlier detection

*IEEE Int. Conf. Mach. Learning and Applications (ICMLA) 2018, 152-7*  
**(podium presentation, acceptance rate 15%)**

61. Kumar N, Rajwade A, Chandran S, Awate SP  
 Kernel generalized-Gaussian mixture model for robust abnormality detection  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2017, 20(1):21-29*  
 Springer LNCS 10435  
**(acceptance rate 32%, student travel award)**
62. Awate SP, Leahy RM, Joshi AA  
 Kernel methods for Riemannian statistical analysis of robust descriptors of cerebral cortical geometry  
*Information Processing in Medical Imaging (IPMI) 2017, 28-40, Springer LNCS 10265*  
**(podium presentation, acceptance rate 16%)**
63. Gupta K, Awate SP  
 Novel Bayesian modeling for dictionary learning and undersampled reconstruction in multishell HARDI  
*Information Processing in Medical Imaging (IPMI) 2017, 453-465, Springer LNCS 10265*  
**(acceptance rate 36%)**
64. Baid A, Kotwal A, Bhalodia R, Merchant SN, Awate SP  
 Joint desmoking, specular removal, and denoising of laparoscopy images  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2017, 732-736*  
**(podium presentation, acceptance rate ~19%)**
65. Shah M, Singha S, Awate SP  
 Leaf classification using marginalized shape context and shape+texture dual-path deep convolutional neural network  
*IEEE Int. Conf. Image Processing (ICIP) 2017, 860-4*  
**(podium presentation)**
66. Kumar N, Rajwade A, Chandran S, Awate SP  
 Kernel generalized Gaussian and robust statistical learning for abnormality detection in medical images  
*IEEE Int. Conf. Image Processing (ICIP) 2017, 4157-61*  
**(in top-10 finalists for Best Paper / Best Student Paper Award from 3000+ submissions, student travel award)**
67. Awate SP, Dhar M, Kulkarni N  
 Robust kernel principal nested spheres  
*IEEE Int. Conf. Pattern Recognition (ICPR) 2016, 402-407*
68. Awate SP, Koushik NN  
 Robust dictionary learning on the Hilbert sphere in kernel feature space  
*Euro. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD) 2016 (1):731-748, Springer LNAI 9851*  
**(podium presentation, acceptance rate 28%)**
69. Shigwan SJ, Awate SP  
 Hierarchical generative modeling and Monte-Carlo EM in Riemannian shape space for hypothesis testing  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2016, 19(3):191-200*  
 Springer LNCS 9902  
**(acceptance rate 30%)**
70. Awate SP, Leahy RM, Joshi AA  
 Riemannian statistical analysis of cortical geometry with robustness to partial homology and misalignment  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2016, 19(1):237-246*

Springer LNCS 9902

**(podium presentation, acceptance rate 5%)**

71. Kotwal A, Bhalodia R, Awate SP  
 Joint desmoking and denoising of laparoscopy images  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2016, 10:1050-1054  
**(podium presentation, acceptance rate 19%)**
72. Gaikwad AV, Shigwan SJ, Awate SP  
 A statistical model for smooth shapes in Kendall shape space  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2015, 18(3):628-635  
 Springer LNCS 9351  
**(acceptance rate 32.5%, student travel award)**
73. Awate SP, Radhakrishnan T  
 Colocalization estimation using graphical modeling and variational Bayesian expectation maximization:  
 Towards a parameter-free approach  
*Information Processing in Medical Imaging (IPMI)* 2015, 24:3-16, Springer LNCS 9123  
**(first podium presentation of the conference, podium presentation, acceptance rate 10%)**
74. Awate SP, Yu Y-Y, Whitaker RT  
 Kernel principal geodesic analysis  
*Euro. Conf. on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML PKDD)* 2014 (1):82-98, Springer LNAI 8724  
**(podium presentation, acceptance rate 23.8%)**
75. Yu Y-Y, Fletcher PT, Awate SP  
 Hierarchical Bayesian modeling, estimation, and sampling for multigroup shape analysis  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2014, 17(3):9-16  
 Springer LNCS 8675  
**(podium presentation, acceptance rate 4.2%)**
76. Awate SP, DiBella EVR  
 Compressed sensing HARDI via rotation-invariant concise dictionaries, flexible k-space undersampling,  
 and multiscale spatial regularity  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2013, 10:9-12  
**(podium presentation, acceptance rate 18%)**
77. Veni G, Fu Z, Awate SP, Whitaker RT  
 Proper-ordered meshing of complex shapes and optimal graph cuts applied to atrial-wall segmentation  
 from DE-MRI  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2013, 10:1284-1287
78. Veni G, Fu Z, Awate SP, Whitaker RT  
 Globally optimal, Bayesian segmentation of atrium wall using graph cuts on 3D meshes  
*Information Processing in Medical Imaging (IPMI)* 2013, 23:656-67, Springer LNCS  
**(acceptance rate 32%)**
79. Wang E, Awate SP, Fletcher PT  
 Adaptive sparsity in Gaussian graphical models  
*Int. Conf. on Machine Learning (ICML)* 2013, pp.1-9, Omnipress  
**(acceptance rate 25%)**
80. Liu W, Awate SP, Fletcher  
 Group study of resting-state fMRI by hierarchical Markov random field  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2012, 15(3):189-196  
 Springer LNCS 7512  
**(acceptance rate 32%)**



81. Awate SP, DiBella EVR  
Spatiotemporal dictionary learning for undersampled dynamic-MRI reconstruction via joint frame-based and dictionary-based sparsity  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2012*, 9:318-321  
**(podium presentation, acceptance rate 15%)**
82. Wang B, Prastawa M, Awate SP, Irimia A, Chambers M, Vespa P, Horn J, Gerig G  
Segmentation of serial MRI of TBI patients using personalized atlas construction and topological change estimation  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2012*, 9:1152-1155
83. Zhu P, Awate SP, Gerber S, Whitaker RT  
Fast shape-based nearest-neighbor search for brain MRIs using hierarchical feature matching  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2011*, 14(2):484-491  
Springer LNCS 6892  
(acceptance rate 30%)
84. Awate SP, Yushkevich P, Licht DJ, Gee JC  
Gender differences in cerebral cortical folding: multivariate complexity-shape analysis with insights into handling brain-volume differences  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2009*, 12(1):200-207  
Springer LNCS 5762  
(acceptance rate 32%)
85. Zhang H, Awate SP, Das S, Woo J, Melhem E, Gee JC, Yushkevich P  
A tract-specific framework for white matter morphometry combining macroscopic and microscopic tract features  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2009*, 12(1):141-149  
Springer LNCS 5762  
**(Young Scientist Award runner-up, in top 8% of 186 eligible papers, in top 3 in category)**
86. Zheng Y, Grossman M, Awate SP, Gee JC  
Automatic correction of intensity nonuniformity from sparseness of gradient distribution in medical images  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2009*, 12(1):852-859  
Springer LNCS 5762  
(acceptance rate 32%)
87. Awate SP, Yushkevich P, Song Z, Licht D, Gee JC  
Multivariate high-dimensional cortical folding analysis, combining complexity and shape, in neonates with congenital heart disease  
*Information Processing in Medical Imaging (IPMI) 2009*, 21:552-563, Springer LNCS 5636  
(acceptance rate 39%)
88. Tustison N, Awate SP, Song G, Cook T, Gee JC  
A new information-theoretic measure to control the robustness-sensitivity trade-off for DMFFD point-set registration  
*Information Processing in Medical Imaging (IPMI) 2009*, 21:215-226, Springer LNCS 5636  
(acceptance rate 39%)
89. Awate SP, Win L, Yushkevich P, Schultz RT, Gee JC  
3D cerebral cortical morphometry in autism: increased folding in children and adolescents in frontal, parietal, and temporal lobes  
*Medical Image Computing and Computer Assisted Intervention (MICCAI) 2008*, 11(1):559-567  
Springer LNCS 5241  
(acceptance rate 35%)

90. Awate SP, Zhang H, Gee JC  
Multivariate segmentation of brain tissues by fusion of MRI and DTI data  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2008, 5:213-216  
**(podium presentation, acceptance rate 17%)**
91. Tustison N, Awate SP, Cai J, Altes T, Miller G, Lange E, Mugler J, Gee JC  
Point-set registration of tagged He-3 images using a structurally-based Jensen-Shannon divergence measure within a deterministic-annealing framework  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2008, 5:772-775  
**(podium presentation, acceptance rate 17%)**
92. Cook PA, Zhang H, Awate SP, Gee JC  
Atlas-guided probabilistic diffusion-tensor fiber tractography  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2008, 5:951-954
93. Song Z, Awate SP, Gee JC  
Nonparametric Markov priors for tissue segmentation  
*IEEE Int. Symposium on Biomedical Imaging (ISBI)* 2008, 5:73-76
94. Song Z, Awate SP, Licht DJ, Gee JC  
Clinical neonatal brain-MRI segmentation using adaptive nonparametric data models and intensity-based Markov priors  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2007, 10(1):883-890  
Springer LNCS 4791  
(acceptance rate 37%)
95. Awate SP, Zhang H, Gee JC  
Fuzzy nonparametric DTI segmentation for robust cingulum-tract extraction  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2007, 10(1):294-301  
Springer LNCS 4791  
(acceptance rate 37%)
96. Awate SP, Gee JC  
A fuzzy, nonparametric segmentation framework for DTI and MRI analysis  
*Information Processing in Medical Imaging (IPMI)* 2007, 20:296-307, Springer LNCS 4584  
(acceptance rate 30%)
97. Awate SP, DiBella EVR, Tasdizen T, Whitaker RT  
Model-based image reconstruction for dynamic cardiac perfusion MRI from sparse data  
*IEEE Conf. Engineering in Medicine and Biology Society* 2006, (1):936-941  
**(podium presentation, acceptance rate 17%)**
98. Awate SP, Tasdizen T, Whitaker RT  
Unsupervised texture segmentation with nonparametric neighborhood statistics  
*Euro. Conf. on Computer Vision (ECCV)* 2006, 9:494-507, Springer LNCS 3952  
(acceptance rate 21%)
99. Tasdizen T, Awate SP, Whitaker RT, Foster N  
MRI tissue classification with neighborhood statistics: a nonparametric, entropy-minimizing approach  
*Medical Image Computing and Computer Assisted Intervention (MICCAI)* 2005, 8(2):517-525  
Springer LNCS 3750  
**(podium presentation, acceptance rate 7%)**
100. Awate SP, Whitaker RT  
Nonparametric neighborhood statistics for MRI denoising  
*Information Processing in Medical Imaging (IPMI)* 2005, 19:677-688, Springer LNCS 3565  
(acceptance rate 26%)

101. Awate SP, Whitaker RT  
Higher-order image statistics for unsupervised, information-theoretic, adaptive image filtering  
*IEEE Computer Vision and Pattern Recognition (CVPR) 2005*, (2):44-51  
**(podium presentation, acceptance rate 6%)**

### Refereed Full-Length Workshop Publications (double-blind review)

102. Upadhyay U, Sudarshan VP, Awate SP  
Uncertainty-aware GAN with adaptive loss for robust MRI enhancement  
*Int. Workshop Computer Vision for Automated Medical Diagnosis (CVAMD) at IEEE ICCV 2021*, 3248-57  
**(podium presentation)**
103. Gupta K, Adlakha D, Agarwal V, Awate SP  
Regularized dictionary learning with robust sparsity fitting for compressed sensing multishell HARDI  
*Int. Workshop Computational Diffusion MRI (CDMRI) at Int. Conf. MICCAI 2016*, 35-48  
Springer Mathematics and Visualization  
**(podium presentation, acceptance rate ~25%)**
104. Wang B, Prastawa M, Saha A, Awate SP, Irimia A, Chambers M, Vespa P, van Horn J, Pascucci V, Gerig G  
Modeling 4D changes in pathological anatomy using domain adaptation: analysis of TBI imaging using a tumor database  
*Int. Workshop Multimodal Brain Image Analysis (MBIA) at Int. Conf. MICCAI 2013*, 3:31-39  
Springer LNCS 8159  
**(Best Paper Award from 24 papers published at MBIA, podium presentation)**
105. Awate SP, Zhu P, Whitaker RT  
How many templates does it take for a good segmentation?: Error analysis in multiatlas segmentation as a function of database size  
*Int. Workshop Multimodal Brain Image Analysis (MBIA) at Int. Conf. MICCAI 2012*, 2:103-114  
Springer LNCS 7509  
**(Best Paper Award from 19 papers published at MBIA, podium presentation)**  
(talk at National Alliance for Medical Image Computing's retreat (Algorithms Core), Park City)
106. Prastawa M, Awate SP, Gerig G  
Building spatiotemporal anatomical models through joint segmentation, registration, and 4D-atlas estimation  
*IEEE Workshop Mathematical Methods in Biomedical Image Analysis (MMBIA)*, 2012, 49-56  
**(podium presentation, acceptance rate 22%)**
107. Liu W, Awate SP, Anderson J, Yurgelun-Todd D, Fletcher PT  
Monte Carlo expectation maximization with hidden Markov models to detect functional networks in resting-state fMRI  
*Int. Workshop Machine Learning in Medical Imaging (MLMI) at Int. Conf. MICCAI 2011*, 2:59-66  
Springer LNCS 7009

### Refereed Papers and Abstracts, Presentations

- Awate SP  
Image encoding in MRI and Bayesian image reconstruction:  
Classical & AI Methods for Image Recon: From Fundamentals to Translation  
*Int. Society of Magnetic Resonance in Medicine (ISMRM) conference 2024*  
**(invited talk)**
- Awate SP  
Uncertainty-aware and robust statistical learning for improved neuroimaging  
*MICCAI Int. Conf. Workshop on Computational Diffusion MRI (CDMRI) 2022*  
**(keynote talk)**

3. Sudarshan VP, Li S, Fernandez A, Ward P, Jamadar S, Egan G, Awate SP, Chen Z  
MRI-assisted high temporal resolution dynamic FDG-PET imaging for assessing brain functions  
*Int. Society of Magnetic Resonance in Medicine (ISMRM) 2020*  
**(podium presentation, acceptance rate 15%, magna cum laude award)**
4. Sudarshan VP, Fernandez A, Pawar K, Li S, Egan G, Awate SP, Chen Z  
Synthesis of standard dose FDG PET images from low dose acquisition using a combination of atlas and CNN based method  
*Int. Society of Magnetic Resonance in Medicine (ISMRM) 2019*  
**(podium presentation, acceptance rate 15%)**
5. Wu J, Awate SP, Licht DJ, Avants B, Clouchoux C, Plessis A, Gee JC, Limperopoulos C  
Cortical folding measurement is a potential indicator for prenatal brain maturity  
*Workshop on Image Analysis of Human Brain Development at Int. Conf. MICCAI 2011, 1:8*
6. Wu J, Awate SP, Licht DJ, Limperopoulos C, Gee JC  
Cortical folding analysis for normal fetuses  
*Int. Society of Magnetic Resonance in Medicine (ISMRM) 2010*  
**(podium presentation, acceptance rate 15%)**
7. Limperopoulos C, Wu J, Licht DJ, Gee JC, Awate SP, Clouchoux C, du Plessis AJ  
Quantitative MRI measurements of cortical development in the fetus  
*Pediatric Academic Society*  
**(podium presentation)**
8. Cook T, Tustison N, Song G, Awate SP, Torigian D, Geftter W, Gee JC  
Segmentation-based quantitation of pulmonary alveolar proteinosis, pre- and post-lavage, using high-resolution computed tomography  
*Proc. Second Int. Workshop on Pulmonary Image Processing at Int. Conf. MICCAI 2009, 61-71*
9. Awate SP, Zhang H, Gee JC  
Novel statistical models and methods for DTI fiber-bundle segmentation  
*Int. Society of Magnetic Resonance in Medicine (ISMRM) 2008*  
**(podium presentation, acceptance rate 15%)**
10. Awate SP, Whitaker RT  
An interactive, parallel, multiprocessor, level-set solver with dynamic load balancing  
School of Computing, University of Utah, Technical Report UUCS-05-002  
*SIAM Conf. Parallel Processing for Scientific Computing (PPSC) 2004*  
**(podium presentation)**

## Software

- Contributed multi-threaded C++ code to widely-used open-source Insight Segmentation and Registration Toolkit (ITK)

## Education

- |      |   |
|------|---|
| 2006 | <b>Ph.D. in Computer Science</b><br>University of Utah<br>Dissertation: Adaptive nonparametric Markov models with information-theoretic methods for image restoration and segmentation                                |
| 2001 | <b>B.E. in Computer Engineering</b> (Distinction each semester, 1 <sup>st</sup> rank in college, 8 <sup>th</sup> rank in univ.)<br>University of Mumbai<br>Thesis: Image restoration using artificial neural networks |

## Professional Service

- Activities, Organization
  - Editorial Board Member, [Medical Image Analysis](#), Elsevier, 2020-present
  - Associate Editor, *Frontiers in Neuroscience: Brain Imaging Methods*, 2020-present
  - Associate Editor, *Medical Physics*, American Association of Physicists in Medicine, 2008-2022
  - IEEE Bio Imaging and Signal Processing Technical Committee (BISP TC) Member (elected), 2021-26
  - Program Chair, IEEE International Symposium on Biomedical Imaging (ISBI) 2022
  - Challenge Committee member, Medical Image Computing and Computer-Assisted Intervention (MICCAI) Conference 2025
  - Area Chair, Medical Image Computing and Computer-Assisted Intervention (MICCAI) Conference 2019
  - Area Chair, Medical Imaging with Deep Learning (MIDL) Conference 2019, 2021
  - Area Chair, IEEE Int. Conf. Image Processing (ICIP), 2022-24
  - Area Chair, IEEE Int. Conf. Pattern Recognition (ICPR), 2024
  - Area Chair, IEEE Int. Conf. Acoustics, Speech and Signal Processing (ICASSP), 2024-25
  - Session Chair (podium), Information Processing in Medical Imaging (IPMI) Conference 2019-21
  - Chair for MedImage workshop at Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2018
  - Organizer for Global Initiative of Academic Networks (GIAN) workshop on Medical Image Computing: Machine Learning Methods and Advanced-MRI Applications (with Prof. Y Rathi, Harvard University). 108 participants from across the nation. 2018
  - Co-Chair for MedImage workshop at Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2016
  - Awards Committee Member for Indian Chapter of Knowledge Discovery and Data Mining (IKDD) 2022
  - Area Chair, Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2016-18
- Peer reviewing for journals
  - IEEE Transactions
    - Medical Imaging (TMI)
    - Image Processing (TIP)
    - Pattern Analysis and Machine Intelligence (TPAMI)
    - Signal Processing (TSP)
    - Computational Imaging (TCI)
    - Fuzzy Systems (TFS)
    - Visualization and Computer Graphics (TVCG)
  - IEEE
    - Signal Processing Letters
    - Access
  - Elsevier
    - Medical Image Analysis (MedIA)
    - Pattern Recognition (PR)
    - Computer Vision and Image Understanding (CVIU)
    - Image and Vision Computing (IVC)
    - NeuroImage (NIMG)
    - Signal Processing
  - Frontiers
    - Computer Science: Computer Vision and Image Analysis
    - Neuroscience: Brain Imaging Methods
    - Oncology: Cancer Imaging and Image-directed Interventions
  - Springer
    - International Journal of Computer Vision (IJCV)
    - Signal Image and Video Processing

- Sadhana, Indian Academy of Sciences
  - National Academy Science Letters
- Society for Industrial and Applied Mathematics (SIAM)
  - Multiscale Modeling and Simulation (MMS)
  - Imaging Sciences (SIIMS)
- Wiley
  - Magnetic Resonance in Medicine (MRM)
  - Journal of Magnetic Resonance Imaging (JMRI)
- SPIE
  - Journal of Electronic Imaging
- Public Library of Science (PLOS)
  - ONE
- Others
  - British Journal of Radiology
  - Cerebral Cortex, Oxford Journals
- Peer reviewing for conferences
  - Scientific Review Committee member for Information Processing in Medical Imaging (IPMI) 2011-2025
  - Medical Image Computing and Computer Assisted Intervention (MICCAI) 2007-2024
  - IEEE International Symposium on Biomedical Imaging (ISBI) 2009-2025
  - European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD) 2019
  - IEEE Int. Conf. Image Processing (ICIP) 2022
  - IEEE Int. Conf. Pattern Recognition (ICPR) 2010, 2020
  - Int. Conf. Acoustics, Speech and Signal Processing (ICASSP) 2021
  - Advisory Board / Program Committee member, MICCAI workshop on Shape in Medical Imaging (ShapeMI) 2023
  - Program Committee member, MICCAI workshop on Computational Diffusion MRI (CDMRI) 2020-21, 2023-24
  - Program Committee member, CVPR workshop on Differential Geometry in Computer Vision and Machine Learning (DiffCVML) 2021
  - Program Committee member, MICCAI workshop on Bayesian and Graphical Models for Biomedical Imaging (BAMBI) 2014-2016
  - Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP) 2014
  - National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG)
  - Asian Conference on Computer Vision (ACCV) 2009
  - British Machine Vision Conference (BMVC) 2020
  - Medical Imaging and Augmented Reality (MIAR) 2008
  - Society for Optical Engineering (SPIE) Medical Imaging 2007
  - ACM SIGGRAPH 2023