

# Suyash P. Awate

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## Education

- 2006      **Ph.D. in Computer Science** (GPA 3.97)  
University of Utah  
Dissertation: Adaptive Markov models with information-theoretic methods for unsupervised image restoration and segmentation  
Advisor: Prof. Ross T. Whitaker
- 2001      **B.E. in Computer Science** (GPA 4.0, *highest distinction*)  
University of Mumbai, India  
Thesis: Image restoration using artificial neural networks  
Advisor: Prof. H. B. Kekre

## Experience

- '09 May – Siemens Corporate Research (SCR), Princeton  
present    Research Scientist in Imaging & Visualization Department
- '06 Oct – University of Pennsylvania, Department of Radiology
- '09 Apr    Postdoctoral Researcher at Penn Image Computing & Science Laboratory (PICSL)  
with Prof. James C. Gee

## Research Areas

image processing (denoising, segmentation, reconstruction, registration),  
medical image analysis (brain, heart, lung; MRI, DTI, CT; pediatric, neonatal),  
statistical inference, pattern recognition, information theory, differential geometry

## Refereed Journal Papers

1. 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
2. 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
3. Awate SP, Whitaker RT  
Feature-preserving MRI denoising: a nonparametric empirical-Bayesian approach  
*IEEE Trans. Medical Imaging (TMI)* 2007; 26(9):1242-1255
4. 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

5. Awate SP, Tasdizen T, Foster N, Whitaker RT  
Adaptive Markov modeling for mutual-information-based, unsupervised MRI brain-tissue classification  
(*invited paper*) *Medical Image Analysis (MedIA)* 2006; 10(5):726-739, Elsevier
6. Awate SP, Whitaker RT  
Unsupervised, information-theoretic, adaptive image filtering for image restoration  
*IEEE Trans. Pattern Analysis & Machine Intelligence (TPAMI)* 2006; 28(3):364-376

### Refereed Full-Length Conference Papers

1. 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 & Computer Assisted Intervention (MICCAI)* 2009; 11(1):200-207, Springer LNCS 5762
2. 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 & Computer Assisted Intervention (MICCAI)* 2009; 11(1):141-149, Springer LNCS 5762  
(*young-investigator-award runner-up; in top 8% of 186 eligible papers; in top 3 in category*)
3. Zheng Y, Grossman M, Awate SP, Gee JC  
Automatic correction of intensity nonuniformity from sparseness of gradient distribution in medical images  
*Medical Image Computing & Computer Assisted Intervention (MICCAI)* 2009; 11(1):852-859, Springer LNCS 5762
4. Awate SP, Yushkevich P, Song Z, Licht DJ, 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
5. 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
6. 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 & Computer Assisted Intervention (MICCAI)* 2008; 11(1):559-567, Springer LNCS 5241
7. 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%)*
8. 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%)*
  9. 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*
  10. Song Z, Awate SP, Gee JC  
Nonparametric Markov priors for tissue segmentation  
*IEEE Int. Symposium on Biomedical Imaging (ISBI) 2008; 5:73-76*
  11. 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 & Computer Assisted Intervention (MICCAI) 2007; 10(1):883-890, Springer LNCS 4791*
  12. Awate SP, Zhang H, Gee JC  
Fuzzy nonparametric DTI segmentation for robust cingulum-tract extraction  
*Medical Image Computing & Computer Assisted Intervention (MICCAI) 2007; 10(1):294-301, Springer LNCS 4791*
  13. 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*
  14. 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 & Biology Society 2006; (1):936-941  
(podium presentation, acceptance rate 17%)*
  15. Awate SP, Tasdizen T, Whitaker RT  
Unsupervised texture segmentation with nonparametric neighborhood statistics  
*European Conference on Computer Vision (ECCV) 2006; 9:494-507, Springer LNCS 3952  
(acceptance rate 21 %)*
  16. Tasdizen T, Awate SP, Whitaker RT, Foster N  
MRI tissue classification with neighborhood statistics: a nonparametric, entropy-minimizing approach  
*Medical Image Computing & Computer Assisted Intervention (MICCAI) 2005; 8(2):517-525, Springer LNCS 3750  
(podium presentation, acceptance rate 7 %)*
  17. 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 %)*

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

## Abstracts, Technical Reports

1. 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 17%)*
2. 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)*

## Professional Service

- Peer reviewing for journals
  - IEEE Transactions
    - Pattern Analysis & Machine Intelligence (TPAMI)
    - Medical Imaging (TMI)
    - Image Processing (TIP)
    - Signal Processing (TSP)
    - Visualization and Computer Graphics (TVCG)
  - Elsevier
    - Medical Image Analysis (MedIA)
    - Image & Vision Computing (JIVC)
    - Pattern Recognition (PR)
    - Parallel & Distributed Computing (JPDC)
  - Society for Industrial & Applied Mathematics (SIAM)
    - Multiscale Modeling & Simulation (MMS)
    - Imaging Sciences (SIIMS)
  - American Association of Physicists in Medicine
    - Medical Physics
- Editorship for journals
  - Associate editor for Medical Physics (American Association of Physicists in Medicine)
- Peer reviewing for conferences
  - Medical Image Computing & Computer Assisted Intervention (MICCAI) 2009, 2008, 2007
  - IEEE International Symposium on Biomedical Imaging (ISBI) 2009

- Medical Imaging & Augmented Reality (MIAR) 2008
- Society for Optical Engineering (SPIE) Medical Imaging 2007

## Patents

International patent applied for Image Denoising with Information-Theoretic Adaptive Filtering ([application # PCT/US2005/039491](#), [publication # WO/2006/050364](#))

## Honors

2009 Young-investigator-award runner-up for MICCAI conference paper (2<sup>nd</sup> author)  
2001 Rank 8/2000 (top 0.4%) in B.E. University of Mumbai; Rank 1/120 in college  
1997 – 2001 Dhirubhai Ambani Undergraduate Merit Scholarship  
1997, 1998 IIT Entrance Exam rank in top 1% 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)

## Computing Skills

- Contributed multi-threaded C++ code to widely-used open-source software ITK
- Image-processing tools: ITK, VTK, Matlab, FFTW, Vispack
- Programming: C/C++, Linux Shell, Perl, OpenGL, GLUT, Tcl/Tk, x86 assembly