

John Tilak Ratnanather

PERSONAL

Work: Center for Imaging Science and Institute for Computational Medicine, Whitaker Biomedical Engineering Institute, The Johns Hopkins University, Clark 301, 3400 North Charles Street, Baltimore, MD 21218.

E-mail: tilak AT cis.jhu.edu

WWW: <http://cis.jhu.edu/~tilak>

RESEARCH INTERESTS

Mathematical models in image analysis of brain structures specifically hippocampus, cingulate gyrus, planum temporale, superior temporal gyrus, auditory cortex and medial prefrontal cortex which have been implicated in a variety of neuropsychiatric and neurodevelopmental disorders as schizophrenia, Alzheimer's, epilepsy, depression, speech and language processing.

Mathematical models of physiological fluid mechanics phenomena such as cochlear fluid mechanics and micromechanics of cochlear outer hair cell.

Computational and analytical methods for solving nonlinear partial differential equations arising in fluid mechanics and biology (e.g. boundary layer separation and EPDiff)

Online webcourses in applied mathematics.

EDUCATION

University of Oxford. D.Phil. Mathematics. "Numerical Analysis of Turbulent Flows". (Joint Advisors: J. S. Rollett and K. W. Morton). 1985–89.

University College London, University London. B.Sc. Mathematics. 1982–85.

PROFESSIONAL EXPERIENCE

Assistant Research Professor, Center for Imaging Science, Dept. of Biomedical Engineering, Johns Hopkins University, Baltimore, MD. (2/02–).

Assistant Research Professor, Institute for Computational Medicine, Johns Hopkins University, Baltimore, MD. (2/06–).

Assistant Research Professor, Dept. of Applied Mathematics and Statistics, Johns Hopkins University, Baltimore, MD. (10/06–).

Visiting Scientist, Institute of Fundamental Science, Massey University, Palmerston North, New Zealand. (05)

Staff Scientist, F.M. Kirby Functional Imaging Research Center, Kennedy Krieger Institute, Baltimore, MD. (8/01–).

Research Associate, Center for Imaging Science, Depts of Electrical and Computer Engineering and Biomedical Engineering, Johns Hopkins University, Baltimore, MD. (9/98–2/02)

Postdoctoral Fellow, Dept. of Biomedical Engineering, Johns Hopkins University School of Medicine, Baltimore, MD. (10/94–8/98)

Postdoctoral Fellow, Dept of Otolaryngology–Head & Neck Surgery, Johns Hopkins University School of Medicine, Baltimore, MD. (10/91–9/94)

Visiting Scientist, Dept. of Mathematics, City University London. (92–01)

Postdoctoral Fellow, Dept. of Mathematics, City University London. (10/89–9/91)

Visiting Scientist, Dept. of Mechanical Engineering, University of Sydney, Australia. (7/91)

Visiting Scientist, Dept. of Mechanical Engineering, Clarkson University, Potsdam, NY. (8/90)

AWARDS AND HONORS

NSF/University of California Program in Mathematics and Molecular Biology Postdoctoral Fellow (10/94–9/96)

Royal Society of London–Australian Academy of Sciences Postdoctoral Fellow. (7/91)

PROFESSIONAL ACTIVITIES

Invited Colloquia

1. "Music and Deafness", Workshop at the 31st Midwinter Meeting of the Association for Research in Otolaryngology, Phoenix, AZ (organizer, 2/08).
2. "Computational Auditory Phrenology: scratching the surface", Workshop on functional organization of the laminar structure of the auditory cortex (also organizer), Johns Hopkins University (2/06)
3. "Computational Anatomy: New Frontiers in Biomedical Imaging" Session co-chair, 2005 Annual Fall Meeting, Biomedical Engineering Society, Baltimore, MD (9/05)
4. "Computational Anatomy of the Auditory Cortex: implications for auditory rehabilitation". 4th Research Symposium for Non-Scientists at the International Convention of the Alexander Graham Bell Association for the Deaf and Hard of Hearing, Anaheim, CA. (6/04).

5. "Computing Metric Distances Between Shapes and the Euler-Poincaré Equations of Computational Anatomy", Short Course at "Image Analysis and Understanding Data from Scientific Experiments" workshop, Los Alamos National Laboratory, Los Alamos, NM. (12/02).
6. Co-chair, Mini-Symposium on "Biomedical Image Analysis and Registration" at 50th SIAM Annual Meeting, Philadelphia, PA. (7/02)
7. "Computing Geodesics Between Anatomical Images", Mini-Symposium on "Comparative Mathematical Structures in 3D Medical Image Analysis" at the 1st SIAM Conference on Imaging Sciences, Boston, MA (3/02).

Invited Presentations

1. "Applications of the Alternating Kernel Mixture model in Computational Anatomy", Graduate School of Biomedical Engineering, University of New South Wales, Sydney, Australia (9/07).
2. "Neuro-imaging of the Deafened Auditory Cortex: potential applications and challenges", Developing a Listening Ear, Newbury, England (7/07).
3. "A few unresolved, if not peripheral, questions on the auditory periphery from the periphery!", The Auditory System, Mathematical Biosciences Institute, Ohio State University (6/07).
4. "Computational Auditory Phrenology: scratching the surface", Mary Hare Grammar School for the Deaf, Newbury, England (6/06)
5. "Computational Anatomy of the deafened auditory cortex: implications for auditory rehabilitation", Division of Audiology, School of Population Health, University of Auckland, New Zealand (8/05).
6. "Computational Anatomy: shape analysis of brain, cortical, cardiac and dendritic structures", New Zealand Institute of Fundamental Sciences, Massey University (8/05).
7. "Salicylate effect on the hydraulic conductivity of the cochlear outer hair cell wall", Auditory Physiology Group, University of Auckland, New Zealand (8/05).
8. "Cortical cartography of the planum temporale in the auditory cortex", Neuropsychiatry Group, Prince of Wales Medical Research Institute, University of New South Wales, Sydney, Australia (8/05).
9. "Computational Anatomy: implications for auditory rehabilitation", Bionic Ear Institute, University of Melbourne, Australia (10/03).
10. "Computational Anatomy: implications for auditory rehabilitation", Cochlea Interest Group, University of New South Wales, Sydney, Australia (10/03).
11. "Beyond the auditory cortex: possible applications of computational anatomy", Cochlear Biophysics Laboratory, Bobby R. Alford Dept. of Otorhinolaryngology, Baylor College of Medicine, Houston, TX. (10/01)
12. Panelist, "Mentoring Women and Minorities", National Partnership in Advanced Computational Infrastructure, All Hands Meeting, San Diego Supercomputer Center. (2/00)
13. "The Ear-Works: the cellular basis of hearing", Colloquium, California State University Northridge. (1/99)
14. "Shake, rattle and roll: the mathematical biology of hearing", Dept. of Mathematics, California State University Northridge. (1/99)
15. "Dancing cochlear outer hair cells: the mathematical biology of hearing", Dept. of Mathematics, Howard University. (4/98)
16. Panelist at "Hear and Now" symposium at Midwinter Meeting of the Association for Research in Otolaryngology, St. Petersburg, FL. (2/97)
17. "What they didn't teach us at school? - Fire in the belly", Oxford Brookes University School of Education, Oxford, England. (8/96)
18. "Is the outer hair cell wall viscoelastic?", Program in Mathematics and Molecular Biology retreat, Napa, CA. (5/96)
19. "Water permeability and membrane-cytoskeleton-subsurface cisterna association in the cochlear outer hair cell", Program in Mathematics and Molecular Biology retreat, Napa, CA. (1/95)
20. "Making the most of the Sun workstation". Dept. of Mathematics, City University London. (10/91)
21. "On self induced thermal boundary layer separation". Dept. of Mathematics, University of New South Wales, Sydney, Australia. (7/91)
22. "Asymptotic modeling of turbulent and thermal boundary layers". Dept. of Mechanical Engineering, Johns Hopkins University, Baltimore, MD. (2/91)
23. "Numerical analysis of turbulent flows", Dept. of Mathematics, City University London. (2/90)
24. "Numerical analysis of turbulent flows", Dept. of Mathematics, University College London. (1/90)

Reviewer

1. Dept of Energy Early Career Research Program ASCR Review – Biology Panel (10/09)
2. ZRG1 MDCN-G (55) Human Brain Project Study Section, National Institutes of Health (9/04).
3. The Volta Review; Quarterly Journal of Mechanics and Applied Mathematics; Journal of Women and Minorities in Science and Engineering; NeuroImage; IEEE Trans. in Biomedical Engineering; Journal of Mathematical Imaging and Vision; SIAM J. Sci. Comp.; Louisiana State University: external review of NSF pre-proposal; MICCAI; IEEE Trans on Image Processing; Annals of Biomedical Engineering; IEEE Trans in Medical Imaging; Psychiatry Research: Neuroimaging; Medical Image Analysis; Human Brain Mapping.

Committee

1. Program Committee, Frontiers in the Convergence of Bioscience and Information Technology, Korea, 2007.

2. Program Committee, Summer 2007 Program on the Geometry and Statistics of Shape Spaces, SAMSI, Raleigh, NC, 2007.
3. Ad-Hoc Committee for Patients Advocacy Group Relations, Association for Research in Otolaryngology. (6/00–6/03; 3/05-3/08)
4. Organizing Committee, Research Symposium, Alexander Graham Bell Association for the Deaf, Washington, DC. (04-)
5. College Financial Aid Award Committee, Alexander Graham Bell Association for the Deaf, Washington, DC. (7/96–)
6. Program Committee, 1998 Alexander Graham Bell Association for the Deaf International Convention, Little Rock, AR.
7. Federal Communications Commission Hearing Aid Compatible Telephone Act Negotiated Rulemaking Committee, Washington, DC. (5/95)

Teaching

1. “Dynamic Programming Applications in Defining Cortical Manifold Boundaries”, invited tutorial, Institute of Pure and Applied Mathematics Graduate Summer School “Mathematics in Brain Imaging”, University of California, Los Angeles. (7/04).
2. “Introduction to Metric Pattern Theory” web course designer and developer. (<http://www.cis.jhu.edu/education/introPatternTheory>)
3. Technology Fellow Mentor, Johns Hopkins University (03-04) and (08-09)
4. Mathematical Association of America/National Science Foundation Project Welcome Fellow: developing interactive web course in Pattern Theory for students from underrepresented communities (7/01–4/04).
5. “Computational Anatomy of the Brain” Research Experience for Undergraduate (REU) Award from Education, Outreach and Training in Partnership in Advanced Computational Infrastructure (EOT-PACI) University of California at San Diego. (00-05)
6. Short Course Instructor “The Power of the Internet -- what it can do for you”, 1998 International Convention of the Alexander Graham Bell Association for the Deaf, Little Rock, AR.
7. Guest Instructor, Physiological Fluid Mechanics, Dept. of Biomedical Engineering, Johns Hopkins University School of Medicine. (4/93; 4/95)

Professional Organizations

Association for Research in Otolaryngology; Society for Industrial and Applied Mathematics (including Life Sciences and Imaging Sciences Groups); American Mathematical Society; Alexander Graham Bell Association for the Deaf and Hard of Hearing, Society for Neuroscience, Organization for Human Brain Mapping.

GRANT FUNDING

Current

1. “Adult Children Study – Neuroanatomical Biomarkers”, Co-investigator, National Institute of Aging, NIH (9/05-)
2. “Computational Anatomy of the deafened auditory cortex” Principal Investigator, National Organization for Hearing Research Foundation. (1/04-10/09)
3. “National Center for Research Resource (NCRR) for Quantitative Functional MRI at 1.5 Tesla: Technical and Research Development (TRD) Program - Algorithmic Methods for Anatomical Brain Analysis” Co-Investigator with M. I. Miller as part of the F.M. Kirby Functional Imaging Center, Kennedy-Krieger Institute, Baltimore, MD. (7/01–6/07)

Prior

1. “Focused Research Group: The geometry, mechanics and statistics of the infinite-dimensional manifold of shapes”, Co-investigator, Division of Mathematical Sciences, NSF (7/05-6/09).
2. “Healthy Aging and Senile Dementia Program Project – Preclinical Diagnosis of Alzheimer’s Disease by High Dimensional Brain Mapping”. Principal Investigator as part of sub-contract with Washington University St Louis. (10/01–12/03)
3. “Morphometry of the Superior Temporal Gyrus” Principal Investigator, National Institute of Mental Health, NIH (1/04-12/08).
4. “Assessment of the Right Hemisphere Auditory Speech Function”, Co-investigator, National Institute of Deafness and Other Communication Disorders, NIH (4/05-03/07)
5. “Mechanics of cochlear outer hair cell” Supplemental award NIDCD. (12/96-7/98)
6. “The biophysics of the subsurface cisterna of the cochlear outer hair cell,” NSF/University of California Berkeley Program in Mathematical and Molecular Biology. (10/94 – 9/96)
7. “Computer models of outer hair cell motility,” Deafness Research Foundation. (1/93-12/95)

PUBLICATIONS (PI, co-PI or corresponding author in bold)

In Progress

1. **Ratnanather JT**, Lal RM, An M, Poynton C, Selemon L, Mori S, Miller MI. Probabilistic Generation of White Matter Fiber Tracts in Diffusion Tensor Imaging.
2. Davis AMJ, Ceritoglu C, **Ratnanather JT**. A Stokesian analysis of a viscous jet impinging on a planar wall.

In review

1. Ceyhan E, Ceritoglu C, Beg MF, Wang L, Morris JC, Csernansky JG, Miller MI, **Ratnanather JT**. Metric distances between hippocampal shapes predict different rates of shape changes in dementia of Alzheimer type and nondemented subjects.
2. Younes L, Zweck J, Wang L, Hosakere M, Ratnanather JT, Csernansky JG, Miller MI. Statistical Analysis of Surface Roughness via Local Area Maps: Application to the Cingulate Gyrus in Healthy and Schizophrenic Subjects
3. Ceyhan, E., Hosakere M, Nishino T., Alexopolous J., Todd RD, **Ratnanather JT**, Miller MI, Botteron KN. Statistical Analysis of Cortical Thickness Using Pooled Distances from Labeled Cortical Distance Maps.
4. Ceyhan E., Hosakere M., Nishino T., Alexopolous J., Todd RD, **Ratnanather JT**, Miller MI, Botteron KN. Censoring Methods for Statistical Analysis of Cortical Thickness Using Labeled Cortical Distance Maps.
5. Botteron KN, Nishino T, Alexopoulos JA, Hosakere M, Priebe CE, **Ratnanather JT**, Flake L, Singer T, Rogers C, Todd RD, Ceyhan E, Miller MI. Ventral Medial Prefrontal Cortex Metrics in Early Onset Major Depressive Disorder: A Twin MRI Study.
6. Botteron KN, Babb CM, Nishino T, Ratnanather JT, Miller MI, Belden AC, Luby JL Hippocampus Volume and Cortisol in Preschool Onset Major Depression.
7. Arrate F, Ratnanather JT, Younes L. Diffeomorphic Active Contours. SIAM J. Imaging Science.
8. Ceritoglu C, Wang L, Selemon LD, Csernansky JG, Miller MI, **Ratnanather JT**, Large deformation diffeomorphic metric mapping registration of *in-vivo* MR images and reconstructed 3D images of histological section images. Frontiers in Neurosciences.

Books & Book Chapters

1. Winslow RL, Helm P, Baumgartner W, Peddi S, Ratnanather T, McVeigh E and Miller MI. Imaging-based integrative models of the heart: closing the loop between experiment and simulation. In “‘In Silico’ Simulation of Biological Processes: Novartis Foundation Symposium, Volume 247”. p. 129-143. Eds. Bock G, Goode JA. 2002.
2. **Ratnanather JT**, Spector AA, Popel AS, Brownell WE. Is the outer hair cell wall viscoelastic? In “Diversity in Auditory Mechanics”, Eds. Lewis ER, Long GR, Lyon RF, Narins PM, Steele CR, Hecht-Poinar E. World Scientific, 1997.
3. Brownell WE, Ratnanather JT, Popel AS, Zhi M, Sit PS. Labyrinthine lateral walls: cochlear outer hair cell permeability and mechanics. In “Active Hearing”, Eds. A. Flock, D. Ottoson, M. Ulfendahl. Elsevier Science Ltd, 1995.
4. **Ratnanather JT**, Brownell WE, Popel AS. The mechanical properties of the cochlear outer hair cell. In “Biophysics of Hair Cell Sensory Systems”, Eds. Duifhuis D, Wit H, VanDijk PM, World Scientific Press, 1993.

Editorials

1. Thompson PM, Miller MI, Poldrack RA, Nichols TE, Taylor JE, Worsley KJ, Ratnanather JT. Special Issue on Mathematics in Brain Imaging, NeuroImage, 44, S1, 2008.
2. Thompson PM, Miller MI, Ratnanather JT, Poldrack RA., Nichols TE. Special Issue on Mathematics in Brain Imaging, NeuroImage, 23, S1, 2004.

Peer-reviewed papers

1. Harms MP, Wang L, Campanella C, Aldridge K, Moffitt AJ, Kuelper J, Ratnanather JT, Miller MI, Barch DM, Csernansky JG. Structural abnormalities in gyri of the prefrontal cortex in individuals with schizophrenia and their non-psychotic siblings. Brit. J. Psychiatry. in press.
2. Steinert-Threlkeld S. and **Ratnanather JT**. Open standards, web-based mathlets: making interactive tutorials using the html5 canvas element. Loci: a journal of online mathematics. <http://mathdl.maa.org/mathDL/55/?pa=content&sa=viewDocument&nodid=3340>
3. Fawkes WG, **Ratnanather JT**. Music at the Mary Hare Grammar School for the Deaf from 1975 to 1988. Visions of Research in Music Education. Vol. 14. Retrieved from <http://www-usr.rider.edu/~vrme>
4. Penumetcha N, Kabadi S, Jedynak B, Walcutt C, Gado MH, Wang L, **Ratnanather JT**. Feasibility of geometric-intensity based semi-automated delineation of the tentorium cerebelli from MRI scans. J. Neuroimaging.
5. Qiu A, Wang L, Younes L, Harms MP, Ratnanather JT, Miller MI, Csernansky JG. Neuroanatomical asymmetry patterns in individuals with schizophrenia and their non-psychotic siblings. NeuroImage.
6. Miller MI, Priebe C, Qiu A, Kolasny A, Brown T, Park Y, Ratnanather JT, Busa E, Jovicich J, Yu P, Dickerson B, Buckner RL and Morphometry BIRN. Collaborative Computational Anatomy: An MRI Morphometry Study of the Human Brain via Diffeomorphic Metric Mapping. Human Brain Mapping, 30:2132-2141, 2009.
7. Lee N, Penumetcha N, Priebe CE, Miller MI, **Ratnanather JT**. Validation of Alternating Kernel Mixture Method: Application to Segmentation of Cortical and Sub-cortical Brain Structures. J. Biomedicine and Biotechnology, <http://dx.doi.org/10.1155/2008/346129>, 2008.
8. Calabrese DR, Wang L, Harms MP, Ratnanather JT, Miller MI, Csernansky JG. Cingulate gyrus neuroanatomy in schizophrenia subjects and their non-psychotic siblings. Schizophrenia Research 104:68-70, 2008.
9. Lee N, Priebe CE, **Ratnanather JT**, Miller MI. Validation of Alternating Kernel Mixture Method Based Segmentation of the Human Brain. 2007 Frontiers in the Convergence of Bioscience and Information Technologies, pp. 477-481, 2007.
10. Zhang S, Younes L, Zweck J, **Ratnanather JT**. Diffeomorphic Surface Flow: a novel method of surface evolution. SIAM J. App. Math. 68:806-824, 2008.
11. Penumetcha N, Jedynak B, Hosakere M, Ceyhan E, Botteron KN, **Ratnanather JT**. Segmentation of arteries in MPRAGE images of the ventral medial prefrontal cortex. Comp. Med. Imag. Graph 32:36-43, 2008.

12. Qiu A, Vaillant M, Barta P, **Ratnanather JT**, Miller MI. Surface-Based Gaussian Random Field Model with Application to Cortical Thickness Variation of Left Planum Temporale in Schizophrenia and Bipolar Disorder. *Hum. Brain Mapp.*, 29: 973-985, 2007 (front cover).
13. Qiu A, Younes L, Wang L, Ratnanather JT, Gillespie SK, Kaplan G, Csernansky JG, Miller MI, Combining Anatomical Manifold Information via Diffeomorphic Metric Mappings for Studying Cortical Thinning of the Cingulate Gyrus in Schizophrenia. *Neuroimage*, 37,821-833, 2007.
14. Munn MA, Alexopoulos J, Nishino T, Babb CM, Flake LA, Singer T, Ratnanather JT, Todd RD, Miller MI, Botteron KN. Amygdala volume analysis in female twins with major depression. *Biological Psychiatry*, 62,415-422, 2007.
15. Wang L, Hosakere M, Trein JCL, Ratnanather JT, Barch, DM, Thompson PA, Qui A, Gado M, Miller MI, Csernansky JG. Abnormalities of Cingulate Gyrus Neuroanatomy in Schizophrenia. *Schizophrenia Res.*, 93, 66-78, 2007.
16. Zhi M, **Ratnanather JT**, Ceyhan E, Popel AS, Brownell WE. Hypotonic swelling of salicylate treated cochlear outer hair cells. *Hearing Research*, 228, 95-104, 2007.
17. Wang L, Beg MF, **Ratnanather JT**, Ceritoglu C, Younes L, Morris JC, Csernansky JG, Miller MI. Large Deformation Diffeomorphism and Momentum Based Hippocampal shape Discrimination in Dementia of the Alzheimer Type. *IEEE Trans Med Imaging*. 26, 462-470, 2007.
18. Spector AA, Grosh K, **Ratnanather JT**, Deo N, Raphael RM. Electromechanical models of the outer hair cell composite membrane. *J. Membrane Biology*. 209:135-152. 2006.
19. Priebe CE, Miller MI, **Ratnanather JT**. Segmenting Magnetic Resonance Images via Hierarchical Mixture Modelling. *Computational Statistics and Data Analysis*. *Computational Statistics & Data Analysis*, 50, 551 – 567. 2006
20. **Ratnanather JT**, Wang L, Nebel MB, Hosakere M, Han X, Csernansky JG, Miller MI. Generation and analysis of the cingulate gyrus cortical surface in healthy and schizophrenia subjects. *Psychiatry Research: NeuroImaging*, 132, 53-68. 2004.
21. Holm DD, **Ratnanather JT**, Trouvé A and Younes L. Soliton Dynamics in Computational Anatomy. *NeuroImage*. 23, S170-S178. 2004.
22. Csernansky JG, Wang L, Joshi SC, Ratnanather JT, Miller MI. Computational Anatomy and Neuropsychiatric Disease: Probabilistic Assessment of Variation and Statistical Inference of Group Difference, Hemispheric Asymmetry, and Time-Dependent Change. *NeuroImage*, 23, S56-S68. 2004.
23. Miller MI, Hosakere M, Barker AR, Priebe CE, Lee N, Ratnanather JT, Wang L, Gado M, Morris JC, Csernansky JG. Labelled Cortical Mantle Distance Maps in the Cingulate Quantify Differences Between Dementia of the Alzheimer Type and Healthy Aging. *Proc. Nat. Acad. Sci.* 100(25):15172-7, 2003.
24. **Ratnanather JT**, Honeycutt NA, Lee NG, Morris HM, Dziorny AC, Hurdal MK, Barta PE, Pearlson GD, Miller MI. Dynamic Programming generation of boundaries of local coordinate submanifolds in the neocortex: application to the Planum Temporale. *NeuroImage*, 20, 359-377, 2003.
25. **Ratnanather JT**, Botteron KN, Nishino T, Lal R, Massie AB, Patel SG, Peddi S, Todd RD, Miller MI, Validation of Cortical Analysis of the Medial Prefrontal Cortex. *NeuroImage*,14,1058-1069, 2001.
26. Daniels PG, **Ratnanather JT**, On the thermal field of a separating wall jet. *J. Engng. Math.*, 40, 372-382, 2000.
27. Miller MI, Massie A, Ratnanather JT, Botteron KN, Csernansky JG. Bayesian construction of geometrically based cortical thickness metrics. *Neuroimage*, 12, 676-687, 2000.
28. **Ratnanather JT**, Brownell WE, Popel AS. Analysis of the hydraulic conductivity of the extracisternal space of the cochlear outer hair cell. *J. Math. Biol.*, 40, 372-382, 2000.
29. **Ratnanather JT**, Zhi M, Brownell WE, Popel AS. The ratio of elastic moduli of cochlear outer hair cell derived from osmotic experiments. *J. Acoust. Soc. Am.*, 99, 1025-1028, 1996.
30. **Ratnanather JT**, Zhi M, Brownell WE, Popel AS. Measurements and a model of the outer hair cell hydraulic conductivity. *Hearing Research*, 96, 33-40, 1996.
31. **Ratnanather JT**, Daniels PG. Solution of the thermal boundary layer equations in regions of flow reversal. *SIAM J. App. Math.* 55, 192-204, 1995.
32. Phillips WRC, Ratnanather JT. The outer region of a turbulent boundary layer. *Physics of Fluids A*, 2, 427-434, 1990.

Reviews

1. Ratnanather JT Review of "Web Accessibility for People with Disabilities", *Volta Review*, 102, no. 2, p.75-76.

Monographs

1. Ratnanather JT Studies in simple turbulence models. Oxford University Computing Laboratory Numerical Analysis Group Research report, NA-87/7, 1987.

Posters and abstracts

1. Csernansky JG, Harms M, Wang L, Cronenwett W, Ratnanather JT, Miller MI, Barch DM. Associations Among Neurobiological Endophenotypes in the Siblings of Schizophrenia Patients. *Am. Coll. Neuropsychopharmacology*, Hollywood FL, 2009.
2. Hennessey J, Bowers M, Kolasny A, Brown T, Ratnanather T, Miller MI. Computational Anatomy Works: Enhancing Paraview for Medical Imaging. *TeraGrid'09*, Arlington VA, 2009.
3. Crocker B, Pisano DV, Poynton CB, Honeycutt NA, Barta PE, **Ratnanather JT**. Validating dynamic programming delineation of the Superior Temporal Gyrus gray/white cortical surface, *Human Brain Mapping*, San Francisco, 2009.

4. Ceritoglu C, Wang L, Trachtenberg M, Selemon LD, Csernansky JG, Miller MI, **Ratnanather JT**, Large Deformation Diffeomorphic Metric Mapping Registration of *in-vivo* MR Images and Reconstructed 3D Images of Histological Sections, Human Brain Mapping, San Francisco, 2009.
5. Ceritoglu C, Wang L, Trachtenberg M, Selemon LD, Csernansky JG, Miller MI, **Ratnanather JT**, Mapping of cortical area 46 laminar boundaries in MRI volumes: a method developed to study the prenatally irradiated macaque, International Congress on Schizophrenia Research, San Diego. 2009.
6. Penumetcha N, Kabadi S, Jedynek B, Walcutt C, Gado MH, Wang L, **Ratnanather JT** Semi-automated delineation of the tentorium cerebelli from MRI scans. Human Brain Mapping, Melbourne, 2008.
7. Lee N, Oishi K, Faria A, **Ratnanather JT**, Wen W, Trollor J, Sachdev P. Automated localization of White Matter Hyperintensities(WMH) on DTI white matter tract atlas. Human Brain Mapping, Melbourne, 2008.
8. Harms MP, Campanella C, Wang L, Aldridge K, Moffitt AJ, Keulper J, Ratnanather J, Miller MI, Barch DM, Csernansky JG. Abnormalities of prefrontal cortex neuroanatomy in siblings at risk for schizophrenia, Society for Neuroscience Annual Meeting, Washington, DC, 2008.
9. Selemon LD, Ceritoglu C, Wang L, Ratnanather JT, Csernansky JG, Miller MI, Rakic P. The Pathologic Effects of Prenatal Irradiation on Cortical Area 46 in the Macaque: Morphometric Analysis of MR Images with Cytoarchitectonic Borders Transferred from Matching Histology Sections. Society for Biological Psychiatry, Washington, D.C. 2008.
10. Harms MP, Calabrese DR, Wang L, Ratnanather J, Miller MI, Csernansky JG. Abnormalities of cingulate gyrus neuroanatomy in siblings at risk for schizophrenia, Society for Neuroscience Annual Meeting, San Diego, 2007.
11. Ceritoglu C, Wang L, Malhotra N, Ratnanather JT, Selemon LD, Csernansky JG, Miller MI. Delineation of a cytoarchitecturally defined macaque cortical area (46) in MRI via large deformation diffeomorphic metric mapping, Society for Neuroscience Annual Meeting, San Diego, 2007.
12. Rukhin A, Vaillant M, Qiu A, Younes L, **Ratnanather JT** Analysis of hippocampal shape change over time in a study of Alzheimer's Disease based on momenta of the EPDiff equation of Computational Anatomy. Effective Computational Methods for Highly Oscillatory Problems: The Interplay between Mathematical Theory and Applications, Isaac Newton Institute of Mathematical Sciences, Cambridge, UK. 2007.
13. Arrate F, Younes L, **Ratnanather JT** A numerical method for solving the EPDiff equation of Computational Anatomy. Effective Computational Methods for Highly Oscillatory Problems: The Interplay between Mathematical Theory and Applications, Isaac Newton Institute of Mathematical Sciences, Cambridge, UK. 2007.
14. Arrate F, Younes L, **Ratnanather JT** A numerical method for solving the EPDiff equation of Computational Anatomy. Statistics of Shape Spaces, SAMSI, Rayleigh, NC. 2007.
15. Lee NA, Mostofsky S, Ratnanather JT Automated Cortical Analysis of Planum Temporales in Children with Autism. Human Brain Mapping, Chicago, 2007.
16. Lee N, Penumetcha N, Priebe C, Wang L, Csernansky J, Miller M, **Ratnanather JT**. Alternating Kernel Mixture Segmentation of Hippocampus and Prefrontal Cortex: a validation study. Human Brain Mapping, Chicago, 2007.
17. Botteron KN, Babb CM, Nishino T, Lobos E, Todorov A, Ratnanather JT, Miller MI, Chorbov V, Todd RD. Lifetime trauma exposure, early onset MDD and 5-HTTLPR genotype influence on hippocampal volume in a young female twin sample. Human Brain Mapping, Chicago, 2007.
18. Ratnanather JT, Younes L, Zweck J, Wang L, Hosakere M, Csernansky JG, Miller MI. Statistical Analysis of Surface Roughness via Local Area Maps: Application to the Cingulate in Healthy and Schizophrenic Subjects. International Congress on Schizophrenia Research, Colorado Springs, CO. 2007.
19. Pisano DV, Poynton CB, Honeycutt NA, Barta PE, Ratnanather JT. Delineating the superior temporal gyrus using dynamic programming in schizophrenia and bipolar disorder. International Congress on Schizophrenia Research, Colorado Springs, CO. 2007.
20. Qiu A, Younes L, Wang L, Ratnanather JT, Csernansky JG, Miller MI. Cortical thinning of the cingulate gyrus in schizophrenia. International Congress on Schizophrenia Research, Colorado Springs, CO. 2007.
21. Pisano DV, Barta P, Ratnanather JT. Morphometrics of the Superior Temporal Gyrus in the General Population. Midwinter Meeting of the Association for Research in Otolaryngology, 2007.
22. Wang L, Gillespie SK, Crismale J, Hosakere, M, Yeung L, Ratnanather JT, Gado MH, Miller MI, Morris JC, Csernansky JG. Structural mapping of the entorhinal cortex in MCI/AD subjects: a validation study. Society for Neuroscience Annual Meeting, Atlanta, GA, 2006.
23. Botteron KN, Babb CM, Nishino T, Storch E, Flake L, Todd RD, Ratnanather JT, Miller MI, Hippocampus Volume in Twins with Early Onset Major Depression. Human Brain Mapping, Florence, 2006.
24. Ceyhan E, Poynton C, Qiu A, Barta P, Miller MI, Ratnanather JT, Statistical Analysis of Gender, Laterality and Diagnosis Effect on Planum Temporale. Human Brain Mapping, Florence, 2006.
25. Qiu A, Vaillant M, Barta P, Miller MI, Ratnanather JT, Left planum temporale cortical thickness variation in schizophrenia. Human Brain Mapping, Florence, 2006.
26. Wang L, Ceritoglu C, Ratnanather JT, Beg MF, Morris JC, Csernansky JG, Miller MI. Initial Velocity and Large-Deformation Diffeomorphic Metric Mapping of Hippocampal Change in Dementia of Alzheimer Type (DAT). Human Brain Mapping, Florence, 2006.
27. Qiu A, Barta P, Miller MI, Ratnanather JT "Lateral asymmetry of the laminar structure of the planum temporale", Midwinter Meeting of the Association for Research in Otolaryngology, 2006.

28. Aldridge GM, Ratnanather JT, Martone ME, Terada M, Beg MF, Fong L, Ceyhan E, Kolasny AE, Brown TJA, Cochran EL, Tang SJ, Pisano DV, Vaillant M, Hurdal MK, Churchill JD, Greenough WT, Miller MI, Ellisman MH. Semi-automated shape analysis of dendrite spines from animal models of FragileX and Parkinson's disease using Large Deformation Diffeomorphic Metric Mapping. Society for Neuroscience Annual Meeting, Washington DC, 2005.
29. Munn MA, Alexopoulos J, Nishino T, Babb CM, Hosakere M, Ratnanather JT, Todd R, Miller MI, Botteron KN. Amygdala volume analysis in twins with major depression. Human Brain Mapping, Toronto, 2005.
30. Wang L, Hosakere M, Ceyhan E, Ratnanather JT, Kaplan G, Gado M, Csernansky JG, Miller MI. Labeled Cortical Mantle Distance Mapping of the Cingulate Gyrus in Schizophrenia. Human Brain Mapping, Toronto, 2005.
31. Beg MF, Buckner RL, Fischl B, Park Y, Ceyhan E, Priebe CE, Ceritoglu C, Kolasny AE, Brown T, Quinn B, Yu, P., Gold B, Ratnanather JT, Miller MI. BIRN Brain Morphometry. Pattern classification of hippocampal shape analysis in a study of Alzheimer's Disease. Human Brain Mapping, Toronto, 2005.
32. Wang L, Beg MF, Ratnanather JT, Csernansky JG, Miller MI. Validating Large-Deformation Diffeomorphic Metric Matching in Hippocampus. Human Brain Mapping, Toronto, 2005.
33. Beg MF, Ratnanather JT, Wang L, Ceyhan E, Priebe CE, Ceritoglu C, Khan A, Lee N, Csernansky JG, Morris JC, Miller MI. Metric distances between hippocampal shapes predict different rates of shape changes in dementia of Alzheimer type and nondemented subjects: a validation study. Human Brain Mapping, Toronto, 2005.
34. Qiu A, Bitouk D, Ratnanather JT, Poynton C, Wang L, Boatman D, Barta P, Csernansky JG, Miller MI. Visualizing cortical thickness on the gray/white cortical surface. Human Brain Mapping, Toronto, 2005.
35. Poynton C, Lal R, Ratnanather JT, Mori S, Boatman D, Miller MI. Probabilistic Tracking of Fiber Pathways Using Dynamic Programming. Human Brain Mapping, Toronto, 2005.
36. Ceyhan E, Hosakere M, Alexopolous J, Nishino T, Babb C, Ratnanather JT, Todd RD, Botteron KN, Miller MI. Analysis of Ventral Medial Prefrontal Cortex Metrics for Depression in Twins. Human Brain Mapping, Toronto, 2005.
37. Qiu A, Bitouk D, Ratnanather JT, Wang L, Csernansky JG, Miller MI. Cingulate Cortical Thickness Variability on the Gray/White Surface. International Congress on Schizophrenia Research, Savannah, GA. 2005.
38. Ratnanather JT The set of hearing-impaired mathematics PhDs is countably finite on the order of at least 22!! Minorities in Mathematics Workshop, Institute for Mathematics and its Applications, University of Minnesota. 2005.
39. Wang L, Trein J, Gado M, Hosakere M, Ratnanather JT, Miller MI, Csernansky JG. Volume, Surface Area, and Thickness of the Cingulate Gyrus in Schizophrenia Subjects. International Congress on Schizophrenia Research, Savannah, GA. 2005.
40. Ratnanather JT, Poynton C, Ceyhan E, Osdoit A, Boatman D. A cortical analysis of the laterality of the planum temporale in hearing, hearing-impaired and central auditory processing disorder subjects. Midwinter Meeting of the Association for Research in Otolaryngology, 2005.
41. Botteron KN, Nishino T, Hosakere M, Babb CM, Alexopoulos J, Flake L, Ratnanather JT, Rogers C, Heath AC, Todd RD, Miller MI. Ventral medial prefrontal cortex heritability and alternations in major depressive disorder: a twin MRI study. Abstracts for the XIIth World Congress of Psychiatric Genetics, Dublin, Ireland. 2004
42. Beg MF, Ceritoglu C, Kolasny AE, Priebe CE, Ratnanather JT, Yashinski R, Younes L, Yu P, Jovicich J, Buckner RL, Pieper S, Fischl B, Miller MI. Biomedical Informatics Research Network: Multi-Site Processing Pipeline for Shape Analysis of Brain Structures. Human Brain Mapping, Budapest, 2004.
43. Botteron KN, Hosakere M, Nishino T, Babb C, Ratnanather JT, Todd RD, Miller MI. Ventral Medial Prefrontal Cortex Metrics in Early Onset Depression: A Twin MRI Study. Human Brain Mapping, Budapest, 2004.
44. Barker AR, Priebe CE, Miller MI, Hosakere M, Ratnanather JT, Csernansky JG, Wang L. Statistical Testing on Labeled Cortical Distance Maps to Identify Dementia Progression. Proceedings of the Joint Statistical Meeting, Section on Nonparametric Statistics, American Statistical Association, 2003.
45. Lee N, Ratnanather JT, Barta PE, Hurdal MK, Miller MI Dynamic Programming Definition of Boundaries of the Planum Temporale. Human Brain Mapping, New York City, NY, 2003.
46. Hurdal MK, Lee A, Ratnanather JT, Nishino T, Miller MI, Botteron KN. Investigating the Medial Prefrontal Cortex with Cortical Flat Mappings Human Brain Mapping, New York City, NY, 2003.
47. Lee N, Ratnanather, JT, Barta, PE, Hurdal MK, Miller MI Dynamic Programming Definition of Boundaries of the Planum Temporale. Conformal Geometry of Surfaces: Theory, Computation and Application. University of Tennessee, Knoxville, TN, 2003.
48. Ratnanather JT. Dynamic Programming in Cortical Surface Analysis. Image Analysis and Understanding Data from Scientific Experiments workshop, Los Alamos National Laboratory, Los Alamos NM, 2002.
49. Beg MF, Ratnanather JT, Miller MI. Computing geodesics between anatomical configurations. Diversity in Computing, Houston, TX, 2001.
50. Beg MF, Majethia A, Browne M, Kaiser TH, Martone M, Wong KF, Massie AB, Homer J, Ratnanather JT, Miller MI. Enhancing tools to manipulate anatomical images: a step towards a federated neuroscience image database. National Partnership for Advanced Computational Infrastructure All-Hands Meeting, San Diego, CA, 2001.
51. Ratnanather JT, Batman S, Francis H, Flores J, Roberts P, Nutt RC. Spatial analysis of spiral ganglion cells from human temporal bones. Midwinter Meeting of the Association for Research in Otolaryngology, 2001.

52. Flores J, Batman S, Ratnanather JT, Francis H. A new method for analyzing 3-D trends in spiral ganglion cell density and distribution from a human temporal bone bank. Symposium on Synaptic Function in Hearing and Balance, Johns Hopkins University, Baltimore, MD., 2000.
53. Stone M, Ratnanather JT, Yang C, Yeh J. Ultrasound Imaging of Speech by Very Intelligent Profoundly Deaf Speakers. Alexander Graham Bell Association for the Deaf and Hard of Hearing International Convention, Philadelphia, PA. 2000.
54. Beg MF, Bhanot G, Miller MI, Ratnanather JT, Walkup R, Younes L. Computing Geodesics on Anatomies. National Partnership for Advanced Computational Infrastructure All-Hands Meeting, San Diego, CA, 2000.
55. Beg MF, Miller MI, Ratnanather JT, Younes L. A gradient method to solve a nonlinear optimization problem arising in computational anatomy. American Mathematical Society Annual Meeting, Washington, D.C., 2000.
56. Ratnanather JT, Jing C, Miller MI. Computational Anatomy of the Brain. National Partnership for Advanced Computational Infrastructure All-Hands Meeting, San Diego Supercomputer Center, 1999.
57. Ratnanather JT, Spector AA, Popel AS, Brownell WE. Analysis of viscoelastic deformations of the cochlear outer hair cell wall. Annual meeting of the American Mathematical Society, Baltimore, MD., 1998.
58. Ratnanather JT, Popel, AS, Brownell WE. A micro-fluidic analysis of the lateral wall of the cochlear outer hair cell. Michigan Interdisciplinary Mathematics Meeting on Modeling and Analysis in Medicine and Biology, Ann Arbor, MI, 1998.
59. Ratnanather JT, Spector, AA, Popel AS, Brownell WE. Viscosity effects on the dynamics of the cochlear outer hair cell. Annual Meeting of the Society of Mathematical Biology, Raleigh, NC, 1997.
60. Ratnanather JT, Spector, AA, Popel AS, Brownell WE. The fluid-membrane interaction in the cochlear outer hair cell wall. Euromech 344: Fluid-structure interactions in biomechanics, London, England, 1996.
61. Ratnanather JT, Spector, AA, Popel AS, Brownell WE. Membrane viscoelastic properties of dancing outer hair cells of the inner ear. Mathematics and Molecular Biology IV, Santa Fe, NM, 1995.
62. Zhi M, Ratnanather JT, Brownell WE. Triggering water permeability changes in outer hair cells. Midwinter Meeting of the Association for Research in Otolaryngology, St. Petersburg, FL, 1995.
63. Popel AS, Ratnanather JT, Sit PS, Brownell WE. Micromechanics of the cochlear outer hair cell. 2nd World Congress in Biomechanics, Amsterdam, Holland, 1994.
64. Sit PS, Bittner CA, Ratnanather JT, Brownell WE. Vesiculation of the outer hair cell cytoplasmic membrane. Midwinter Meeting of the Association for Research in Otolaryngology, St. Petersburg, FL. 1994.
65. Ratnanather JT, Brownell WE, Popel AS. Mechanical properties and water permeability coefficient of the outer hair cell. Midwinter Meeting of the Association for Research in Otolaryngology, St. Petersburg, FL. 1993.
66. Ratnanather JT, Daniels PG. Self-induced thermal boundary layer separation. 44th Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Phoenix, AZ, 1991.
67. Ratnanather JT, Daniels PG. On self-induced thermal boundary layer separation. 40th British Applied Mathematics Colloquium, Oxford, England, 1991.
68. Ratnanather JT E-mail: a tool for the disabled scientist and student. "Changing lives: New technology for people with disabilities" symposium at American Association for the Advancement of Science Annual Meeting, Washington DC, 1991.
69. Ratnanather JT. E-mail: - the way forward. XVIIth Int. Congress on the Education of the Deaf, Rochester, NY, 1990.
70. Ratnanather JT, Phillips WRC. The turbulence law of the wake in a boundary layer. 42nd Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Palo Alto, CA, 1989.
71. Ratnanather JT, Phillips WRC. The outer region of a turbulent boundary layer. 41st Annual meeting of the Division of Fluid Dynamics of the American Physical Society, Buffalo, NY, 1988.

Proceedings and Conference Articles

1. Allasonnière S, Kuhn E, **Ratnanather JT** and Trouvé A. Consistent Atlas Estimation on BME Template Model: Applications to 3D Biomedical Images. PMMIA 2009: Probabilistic Models for Medical Image Analysis. London, 2009.
2. Segars WP, Sturgeon G, Li X, Cheng L, Ceritoglu C, **Ratnanather JT**, Miller MI, Tsui BMW, Frish D, Samei E. Patient specific computerized phantoms to estimate dose in pediatric CT. Medical Imaging 2009: Physics of Medical Imaging. Edited by Samei E and Hsieh J. Proceedings of the SPIE, Volume 7258, pp. 72580H-72580H-9, 2009.
3. Lee N, Penumetcha N, Priebe CE, **Ratnanather JT**, Miller MI. Validation of Alternating Kernel Mixture Method Based Segmentation of the Human Brain. Proc. Frontiers in the Convergence of Bioscience and Information Technology, pp. 477-481, 2007.
4. Ceyhan E, Fong L, Tasky TN, Hurdal MK, Beg MF, Martone ME, **Ratnanather JT**. Type-Specific Analysis of Morphometry of Dendrite Spines of Mice. 5th Int. Symp. Image Signal Proc. Analysis, ISPA 2007.
5. Ceyhan E, Hosakere M, Nishino T, Alexopolous J, Todd RD, **Ratnanather JT**, Botteron, K.N., Miller, M.I. Statistical Analysis of Morphometric Measures Based on Labeled Cortical Distance Maps. 5th Int. Symp. Image and Signal Processing and Analysis, ISPA 2007, 13-18.
6. Ceyhan E, Ölken RÇ, Fong L, Tasky TN, Hurdal MK, Beg MF, Martone ME, **Ratnanather JT**. Modeling Metric Distances of Dendrite Spines of Mice Based on Morphometric Measures. Int. Symp on Health Informatics and Bioinformatics, 2007.

7. **Ratnanather JT** Computational Anatomy of the Auditory Cortex: implications for auditory rehabilitation". In "From Cochlea to Cortex: understanding auditory dysfunction" Proceedings of the 4th Research Symposium for Non-Scientists at the International Convention of the Alexander Graham Bell Association for the Deaf and Hard of Hearing, June 2004.
8. **Ratnanather JT**, Priebe CE, Miller MI. Semi-automated segmentation of cortical subvolumes via hierarchical mixture modeling. Medical Imaging 2003: Image Processing. Edited by Sonka, Milan; Fitzpatrick, J. Michael. Proceedings of the SPIE, Volume 5032, pp. 1602-1612, 2003.
9. Popel AS, Ratnanather JT, Spector AA, Sit PS, Jerry RA, Brownell WE. Mechanics of the cochlear outer hair cell. Proceedings of the Fourth China-Japan-USA-Singapore Conference on Biomechanics, Taiyuan, Shaxi, China, 1995.
10. Sit PS, Ratnanather JT, Popel AS, Brownell WE. Micromechanical properties of the outer hair cell of the inner ear. Proc. 13th Southern Biomedical Engineering Conference, Washington, DC, 1994.
11. Brownell WE, Ratnanather JT, Pollice PA, Zhi M, Sit PS. Subsurface cisternal contributions to outer hair cell mechanics and electromotility. Proc. Sendai Symp. 3,111-115, Tohoku University School of Medicine, Sendai, Japan, 1993.
12. **Ratnanather JT**, Rollett JS. A Petrov-Galerkin scheme for incompressible turbulent flows. Proceedings of the 6th International Conference on Finite Element Methods in Australia, Eds. Steven GP, Kelly DW, Mclvor C, University of Sydney, 1991.
13. **Ratnanather JT**, Daniels.PG. Reversed flow calculations of high Prandtl number thermal boundary layer separation. Proceedings of 4th International Symposium on Transport Phenomena in Heat and Mass Transfer (ISTP-IV), Sydney, Australia, Ed. JA Reizes. Elsevier Science Publishers, 1991.

Other publications

1. Raphael RM and Ratnanather JT. Deaf and Hard of Hearing People in Biomedical Engineering and Bioengineering. Volta Voices, p. 22-24 March/April 2003.
2. Ratnanather JT. The Power of Two Line Voice Carry Over. Contact. 12, 22-27, 1997.
3. Ratnanather JT. Eight years in higher education: a deaf perspective. In "European Conference: a european university for students with special needs". Ed. C. Marco, University of Mons, Belgium, 1990.
4. Ratnanather JT. International and national research computer networks - their implications for hearing impaired students. In "European Deaf Students Can : Deaf Students in Higher Education", Ed. Carter, K., Deaf-Fax, University of Reading, England, 1988.
5. Ratnanather JT. Experiences of a deaf undergraduate. In Proceedings of the XVIth International Congress on the Education of the Deaf, Manchester, UK 1985, Ed. Taylor, I.G. Croom-Helm Publishers, 1987.