

Keith John WORSLEY

CURRICULUM VITAE

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Academic background

1978 Ph.D. in Mathematical Statistics, Auckland University, New Zealand, under the supervision of Professors A.J. Scott and G.A.F. Seber. Thesis title: *Significance testing in Automatic Interaction Detection (A.I.D.)*

1973 M.Sc. with first class honours in Mathematics and Statistics, Auckland University, New Zealand.

1972 B.Sc. in Mathematics and Physics, Auckland University, New Zealand.

Academic experience

2008- Full Professor. Department of Statistics, University of Chicago.

2004-2011 James McGill Professor. Department of Mathematics and Statistics, McGill University.

1998- Associate Member, Department of Neurology and Neurosurgery, McGill University.

1994- Full Professor. Department of Mathematics and Statistics, McGill University.

1984-1994 Associate Professor. Department of Mathematics and Statistics, McGill University.

1985-1986 Professeur Associé. Laboratoire de Statistique et Probabilité, Université Paul Sabatier, Toulouse, France.

1978-1984 Assistant Professor. Department of Mathematics, McGill University.

Teaching

Since 1978, four courses per year (40 hours of lectures per course) including: introductory probability and statistics (with and without calculus); regression; generalized linear models (taught in English and French); sample surveys; spectral analysis of time series; multivariate statistics; geometry of random fields (readings course), parameterized variance models (since 2000, 2 courses per year).

SUPPORT HELD IN THE PAST FOUR YEARS, 2003-2007 (principal investigator in **bold**).

Worsley, K.J.	NSERC, Research Grant: <i>Random fields and brain mapping</i> , 20 hours/month.	42,000	1999-2003
Joseph, L., MacGibbon, B., Ramsay, J.O., Vandal, A.C., Wolfson, D.B. et Worsley, K.J.	FCAR, Subvention d'équipe de recherche: <i>Le développement des méthodes statistiques pour l'analyse des données spatio-temporelles de la cartographie cérébrale de la sclérose en plaque: alignement des images, champs aléatoires, ondelettes et analyse de survie</i> , 20 hours/month.	66,000	2000-2003
Evans, A.C. , Paus, T., Petrides, M., Pike, B., Worsley, K.J.	Human Brain Map Project: Phase 1 Renewal: <i>Correlations and analysis</i> , 10 hours/month.	232,765 (US)	1998-2003
Bressler, S., Ferree, T.C., George, J.S., Makeig, S., McIntosh, A.R., Simpson, G.V. & Worsley, K.J.	NIH/NSF Project: <i>Network for the study of brain systems and dynamics</i> , 10 hours/month.	329,143 (US)	2002-2005
Evans, A.C. , Pike, B. & Worsley, K.J.	CIHR, Operating Grant: <i>Structural-functional brain mapping</i> , 10 hours/month.	92,323	2002-2007
Evans, A.C. , Lange, N., Leonard, G., Mazziotta, J.C., McCracken, J., Paus, T., Petrides, M., Pike, B., Toga, A.W., Worsley, K.J., & Zefiro, T.	NIH Research Contract: <i>Data Coordinating Centre (DCC) for a MRI study of normal development</i> , 10 hours/month.	853,669 (US)	1999-2006
Worsley, K.J.	NSERC, Discovery Grant: <i>Random fields and brain mapping</i> , 20 hours/month.	49,000	2003-2007
Asgharian, M., Joseph, L., MacGibbon, B., Ramsay, J.O., Steele, R., Vandal, A.C., Wolfson, D.B. et Worsley, K.J.	NATEQ, Projet d'équipe de recherche: <i>Méthodes statistiques pour données spatio-temporelles de cartographie cérébrale: recalage et segmentation, champs aléatoires, analyse des données fonctionnelles, ondelettes et analyse de survie</i> , 20 hours/month.	70,000	2003-2006
Evans, A.C. , Paus, T., Pike, B. & Worsley, K.J.	NIH Operating Grant: <i>Automated 3D measurement of cortical thickness</i> , 10 hours/month.	100,000 (US)	2003-2006

Lange, N. , Worsley, K., Coull, B. Berretta, S. Froimowitz, M., Fischer, K., Giedde, J., Jackway, P., Benes, F., & Siekmeier, P.	NIH Operating Grant 2R01NS037483-06A1: <i>Biostatistical Methods for Human Brain Mapping</i> , 10 hours/month.	525,000 (US)	2004-2007
Asgharian, M., Darmon, H., Goren, E., Labute, J., Nigam, N., Tupper, P., Vandal, A., Worsley, K.	NSERC Research Tools and Instruments Grant: <i>Server and workstations for mathematics and statistics</i> , 10 hours/month.	23,333	2006
Asgharian, M., Joseph, L., MacGibbon, B., Ramsay, J.O., Steele, R., Vandal, A.C., Wolfson, D.B. et Worsley, K.J.	NATEQ, Équipement: <i>Infrence bayésienne et fréquentiste pour données spatio-temporelles d'imagerie</i> , 5 hours/month.	18,585	2006
Evans, A.C. , Collins, L., Pike, B. & Worsley, K.J.	NIMH, NIFTI: <i>Characterising, validating and comparing neuroimaging informatics tools</i> , 10 hours/month.	250,000 (US)	2003-2007

RESEARCH SUPPORT CURRENTLY HELD (principal investigator in **bold**).

Worsley, K.J.	McGill University: James McGill Professorship, 10 hours/month.	15,000	2004-2011
Asgharian, M., Joseph, L., MacGibbon, B., Ramsay, J.O., Steele, R., Vandal, A.C., Wolfson, D.B. et Worsley, K.J.	NATEQ, Projet de recherche en équipe : <i>Infrence bayésienne et fréquentiste pour données spatio-temporelles d'imagerie</i> , 20 hours/month.	45,000	2006-2009
Worsley, K.J.	NSERC, Discovery Grant: <i>Random fields, brain mapping and "bubbles"</i> , 20 hours/month.	50,000	2008-2013

Research Contributions (student coauthors in bold)

Refereed journal publications, published or accepted

1. **Carbonell, F.**, Galan, L. & Worsley, K.J. (2008). The geometry of the Wilks's Lambda random field. *Annals of the Institute of Statistical Mathematics*, accepted.
2. Poldrack, R.A., Fletcher, P.C., Henson, R.N., Worsley, K.J., Brett, M. & Nichols, T.E. (2008). Guidelines for reporting an fMRI study. *NeuroImage*, **40**:409-414.
3. Bernhardt, B.C., Worsley, K.J., Besson, P., Concha, L., Lerch, J.P., Evans, A.C. & Bernasconi, N. (2008). Mapping limbic network organization in temporal lobe epilepsy using morphometric correlations: Insights on the relation between mesiotemporal connectivity and cortical atrophy. *NeuroImage*, available online 11 May 2008.
4. **Carbonell, F.** & Worsley, K.J. (2008). On the geometry of a generalized cross-correlation random field. *Statistics and Probability Letters*, accepted.
5. Taylor, J.E. & Worsley, K.J. (2008). Random fields of multivariate test statistics, with applications to shape analysis. *Annals of Statistics*, **36**:1-27.
6. **Chamandy, N.**, Worsley, K.J., Taylor, J.E. & Gosselin, F. (2007). Tilted Euler characteristic densities for Central Limit random fields, with an application to 'bubbles'. *Annals of Statistics*, accepted.
7. Taylor, J.E., Worsley, K.J. & Gosselin, F. (2007). Maxima of discretely sampled random fields, with an application to 'bubbles'. *Biometrika*, **94**:1-18.
8. Taylor, J.E. & Worsley, K.J. (2007). Detecting sparse signal in random fields, with an application to brain mapping. *Journal of the American Statistical Association*, **102**:913-928.
9. Di Paola, M., Worsley, K.J. & Tomaiuolo, F. (2007). Episodic memory impairment in patients with Alzheimers Disease is correlated with entorhinal cortex atrophy: a voxel-based morphometry study. *Journal of Neurology*, **254**:774-781.
10. Charil, A., Dagher, A., Lerch, J.P., Zijdenbos, A.P., Worsley, K.J. & Evans, A.C. (2006). Focal cortical atrophy in multiple sclerosis: Relation to lesion load and disability. *NeuroImage*, **34**:509-517.
11. Lerch, J.P., Worsley, K.J., Shaw, W.P., Greenstein, D.K., Lenroot, R.K., Giedd, J. & Evans, A.C. (2006). Mapping anatomical correlations across cerebral cortex (MACACC) using cortical thickness from MRI. *NeuroImage*, **31**:993-1003.
12. Taylor, J.E. & Worsley, K.J. (2006). Inference for magnitudes and delays of responses in the FIAC data using BRAINSTAT/FMRISTAT. *Human Brain Mapping*, **27**:434-441.
13. Worsley, K.J. & Taylor, J.E. (2006). Detecting fMRI activation allowing for unknown latency of the hemodynamic response. *NeuroImage*, **29**:649-654.
14. Monchi, O., Petrides, M., Strafella, A.P., Worsley, K.J. & Doyon, J. (2006). Functional role of the basal ganglia in the planning and execution of actions. *Annals of Neurology*, **59**:257-264.
15. Chauvin, A., Worsley, K.J., Schyns, P.G., Arguin, M., & Gosselin, F. (2005). Accurate statistical tests for smooth classification images. *Journal of Vision*, **5**:659-667.

16. Worsley, K.J., Chen, J.-I., Lerch, J. & Evans, A.C. (2005). Comparing functional connectivity via thresholding correlations and singular value decomposition. *Philosophical transactions of the Royal Society*, **360**:913-920.
17. Worsley, K.J. (2005). Spatial smoothing of autocorrelations to control the degrees of freedom in fMRI analysis. *NeuroImage*, **26**:635-641.
18. Tomaiuolo, F., Worsley, K.J., Lerch, J., Di Paulo, M., Carlesimo, G.A., Bonanni, R., Caltagirone, C. & Paus, T. (2005). Changes in white matter in long-term survivors of severe non-missile traumatic brain injury: a computational analysis of magnetic resonance images. *Journal of Neurotrauma*, **22**:76-82.
19. Worsley, K.J. (2005). An improved theoretical P-value for SPMs based on discrete local maxima. *NeuroImage*, **28**:1056-1062.
20. Worsley, K.J., Taylor, J.E., Tomaiuolo, F. & Lerch, J. (2004). Unified univariate and multivariate random field theory. *NeuroImage*, **23**:S189-195.
21. Hayasaka, S., Luan-Phan, K., Liberzon, I., Worsley, K.J. & Nichols, T.E. (2004). Non-Stationary cluster-size inference with random field and permutation methods. *NeuroImage*, **22**:676-687.
22. Monchi, O., Petrides, M., Doyon, J., Postuma, R.B., Worsley, K.J. & Dagher, A. (2004). Neural bases of set-shifting deficits in Parkinson's disease. *Journal of Neuroscience*, **24**:702-710.
23. Carbonell, F., Galan, L., Valdes, P., Worsley, K.J., Biscay, R.J., Diaz-Comas, L., Bobes, M.A. & Parra, M. (2004). Random field-union intersection tests for EEG/MEG imaging. *NeuroImage*, **22**:268-276.
24. Chen, J.-K., Johnston, K.M., Frey, S., Petrides, M., Worsley, K.J. & Ptito, A. (2004). Functional abnormalities in symptomatic concussed athletes: an fMRI study. *NeuroImage*, **22**:68-82.
25. Worsley, K.J. (2003). Detecting activation in fMRI data. *Statistical Methods in Medical Research*, **12**:401-418.
26. Charil, A., Zijdenbos, A.P., Taylor, J., Boelman, C., Worsley, K.J., Evans, A.C. & Dagher, A. (2003). Statistical mapping analysis of lesion location and neurological disability in multiple sclerosis: application to 452 patient data sets. *NeuroImage*, **19**:532-544.
27. **Shafie, Kh.**, Sigal, B., Siegmund, D. & Worsley, K.J. (2003). Rotation space random fields with an application to fMRI data. *Annals of Statistics*, **31**, 1732-1771.
28. Olausson, H., Lamarre, Y., Backlund, H., Morin, C., Wallin, B.G., Starck, G., Ekholm, S., Strigo, I., Worsley, K.J., Vallbo, A.B. & Bushnell, M.C. (2002). Unmyelinated tactile afferents signal touch and project to insular cortex. *Nature Neuroscience*, **5**:900-904.
29. **Chung, M.K.**, Worsley, K.J., Robbins, S., Paus, T., Taylor, J., Giedd, J.N., Rapoport, J.L. & Evans, A.C. (2002). Deformation-based surface morphometry applied to gray matter deformation. *NeuroImage*, **18**:198-213.
30. Kherif, F., Poline, J.-B., Flandin, G., Benali, H., Dehane, S. & Worsley, K.J. (2002). Multivariate model definition for fMRI data. *NeuroImage*, **4**:1068-1083.
31. **Liao, C.**, Worsley, K.J., Poline, J.-B., Duncan, G.H. & Evans, A.C. (2002). Estimating the delay of the response in fMRI data. *NeuroImage*, **16**:593-606.

32. Worsley, K.J., **Liao, C., Aston, J.A.D.**, Petre, V., Duncan, G.H., Morales, F. & Evans, A.C. (2002). A general statistical analysis for fMRI data. *NeuroImage*, **15**:1-15.
33. Monchi, O., Petrides, M., Petre, V., Worsley, K.J. & Dagher, A. (2001). Wisconsin card sorting revisited: distinct neural circuits participating in different stages of the task identified by event-related functional magnetic resonance imaging. *Journal of Neuroscience*, **21**:7733-7741.
34. Watkins, K.E., Paus, T., Lerch, J.P., Zijdenbos, A., Collins, D.L., Neelin, P., Taylor, J., Worsley, K.J. & Evans, A.C. (2001). Structural asymmetries in the human brain; A voxel-based statistical analysis of 142 MRI scans. *Cerebral Cortex*, **11**:868-877.
35. Worsley, K.J. (2001). Testing for signals with unknown location and scale in a χ^2 random field, with an application to fMRI. *Advances in Applied Probability*, **33**:773-793.
36. **Chung, M.K.**, Worsley, K.J., Paus, T., Cherif, C., Collins, D.L., Giedd, J.N., Rapoport, J.L. & Evans, A.C. (2001). A unified statistical approach for deformation based morphometry. *NeuroImage*, **14**:595-606.
37. Andrade, A., Kherif, F., Mangin, J-F., Paradis, A-L., Worsley, K.J., Simon, O., Dehaene, S., Le Bihan, D. & Poline, J-B. (2001). Detection of fMRI activation using cortical surface mapping. *Human Brain Mapping*, **12**:79-93.
38. **Aston, J.A.D.**, Gunn, R.N., Worsley, K.J., Ma, Y., Evans, A.C. & Dagher, A. (2000). A statistical method for the analysis of positron emission tomography neuroreceptor ligand data. *NeuroImage*, **12**:245-256.
39. Worsley, K.J. & Friston, K.J. (2000). A test for a conjunction. *Statistics and Probability Letters*, **47**:135-140.
40. Kiebel, S.J., Poline, J-B., Friston, K.J., Holmes, A.P. & Worsley, K.J. (1999). Robust smoothness estimation in statistical parametric maps using normalised residuals from the general linear model. *NeuroImage*, **10**:756-766.
41. Pike, G.B., De Stefano, N., Narayanan, S., Worsley, K.J., Pelletier, D., Francis, G.S., Antel, J.P. & Arnold, D.L. (1999). Imaging pre-lesional pathology in multiple sclerosis using magnetization transfer. *Radiology*, **215**:824-830.
42. Worsley, K.J., **Andermann, M., Koulis, T.**, MacDonald, D. & Evans, A.C. (1999). Detecting changes in nonisotropic images. *Human Brain Mapping*, **8**:98-101.
43. Friston, K.J., Holmes, A.P. & Worsley, K.J. (1999). How many subjects constitute a study? *NeuroImage*, **10**:1-5.
44. Paus, T., Zijdenbos, A., Worsley, K.J., Collins, D.L., Blumenthal, J., Giedd, J.N., Rapoport, J.L. & Evans, A.C. (1999). Structural maturation of neural pathways in children and adolescents: In vivo study. *Science*, **283**:1908-1911.
45. Friston, K.J., Holmes, A.P., Price, C.J., Büchel, C. & Worsley, K.J. (1999). Multi-subject fMRI studies and conjunction analyses. *NeuroImage*, **10**:385-396.
46. **Cao, J.** & Worsley, K.J. (1999). The geometry of correlation fields, with an application to functional connectivity of the brain. *Annals of Applied Probability*, **9**:1021-1057.

47. **Cao, J.** & Worsley, K.J. (1999). The detection of local shape changes via the geometry of Hotelling's T^2 fields. *Annals of Statistics*, **27**:925-942.
48. Worsley, K.J., **Cao, J.**, Paus, T., Petrides, M. & Evans, A.C. (1998). Applications of random field theory to functional connectivity. *Human Brain Mapping*, **6**:364-367.
49. Worsley, K.J., Poline, J.B., Friston, K.J. & Evans, A.C. (1998). Characterizing the response of PET and fMRI data using Multivariate Linear Models (MLM). *NeuroImage*, **6**:305-319.
50. **Fu, L.**, Matthews, P.M., De Stefano, N., Worsley, K.J., Narayanan, S., Francis, G.S., Antel, J.P., Wolfson, C. & Arnold, D.L. (1998). Imaging axonal damage of normal-appearing white matter in multiple sclerosis. *Brain*, **121**:103-113.
51. Worsley, K.J. (1997). An overview and some new developments in the statistical analysis of PET and fMRI data. *Human Brain Mapping*, **5**:254-258.
52. Poline, J.B., Worsley, K.J., Evans, A.C. & Friston, K.J. (1997). Combining spatial extent and peak intensity to test for activations in functional imaging. *NeuroImage*, **5**:83-96.
53. Worsley, K.J., Marrett, S., Neelin, P., **Vandal, A.C.**, Friston, K.J. & Evans, A.C. (1996). A unified statistical approach for determining significant signals in images of cerebral activation. *Human Brain Mapping*, **4**:58-73.
54. Worsley, K.J., Marrett, S., Neelin, P. & Evans, A.C. (1996). Searching scale space for activation in PET images. *Human Brain Mapping*, **4**:74-90.
55. Worsley, K.J. (1996). The geometry of random images. *CHANCE*, **9**(1):27-40.
56. Paus, T., Perry, D.W., Zatorre, R.J., Worsley, K.J. & Evans, A.C. (1996). Modulation of cerebral blood-flow in the human auditory cortex during speech: role of motor-to-sensory discharges. *European Journal of Neuroscience*, **8**(11):2236-2246.
57. **Fu, L.**, Wolfson, C., Worsley, K.J., De Stefano, N., Collins, D.L. & Narayanan, S. (1996). Statistics for investigation of multimodal MR imaging data and an application to multiple sclerosis patients. *Nuclear Magnetic Resonance in Biomedicine*, **9**:339-346.
58. Paus, T., Marrett, S., Worsley, K.J. & Evans, A.C. (1996). Imaging motor-to-sensory discharges in the human brain: An experimental tool for the assessment of functional connectivity. *NeuroImage*, **4**:78-86.
59. Poline, J.B., Worsley, K.J., Holmes, A.P., Frackowiak, R.S.J. & Friston, K.J. (1995). Estimating smoothness in statistical parametric maps: Variability of p values. *Journal of Computer Assisted Tomography*, **19**:788-796.
60. Vanier, M., Tsuiki, K., Grdiša, M., Worsley, K.J. & Diksic, M. (1995). Determination of the lumped constant for the α -methyl-tryptophan method of estimating the rate of serotonin synthesis. *Journal of Neurochemistry*, **64**:624-635.
61. Worsley, K.J. (1995). Estimating the number of peaks in a random field using the Hadwiger characteristic of excursion sets, with applications to medical images. *Annals of Statistics*, **23**:640-669.
62. Siegmund, D.O. & Worsley, K.J. (1995). Testing for a signal with unknown location and scale in a stationary Gaussian random field. *Annals of Statistics*, **23**:608-639.

63. Worsley, K.J. (1995). Boundary corrections for the expected Euler characteristic of excursion sets of random fields, with an application to astrophysics. *Advances in Applied Probability*, **27**:943-959.
64. Friston, K.J., Holmes, A.P., Worsley, K.J., Poline, J-B., Frith, C.D. & Frackowiak, R.S.J. (1995). Statistical parametric maps in functional imaging: A general linear approach. *Human Brain Mapping*, **2**:189-210.
65. Worsley, K.J. & Friston, K.J. (1995). Analysis of fMRI time-series revisited - again. *NeuroImage*, **2**:173-181.
66. Worsley, K.J., Poline, J-B., **Vandal, A.C.** & Friston, K.J. (1995). Tests for distributed, non-focal brain activations. *NeuroImage*, **2**:183-194.
67. Poline, J-B., Worsley, K.J., Holmes, A.P., Frackowiak, R.S.J. & Friston, K.J. (1995). Estimating smoothness in statistical parametric maps: Variability of P values. *Journal of Computer Assisted Tomography*, **19**:788-796.
68. Paus, T., Marrett, S., Worsley, K.J. & Evans, A.C. (1995). Extraretinal modulation of cerebral blood flow in the human visual cortex: Implication for saccadic suppression. *Journal of Neurophysiology*, **74**:2179-2183.
69. Leblanc, R. & Worsley, K.J. (1995). Surgery of unruptured, asymptomatic aneurysms: A decision analysis. *Canadian Journal of Neurological Science*, **22**:30-35.
70. Worsley, K.J. (1994). Local maxima and the expected Euler characteristic of excursion sets of χ^2 , F and t fields. *Advances in Applied Probability*, **26**:13-42.
71. Friston, K.J., Worsley, K.J., Frackowiak, R.S.J., Mazziotta, J.C. and Evans, A.C. (1994). Assessing the significance of focal activations using their spatial extent. *Human Brain Mapping*, **1**:214-220.
72. Leblanc, R., Worsley, K.J., Melanson, M.D. & Tampieri, D. (1994). Angiographic screening and elective surgery of familial cerebral aneurysms: a decision analysis. *Neurosurgery*, **35**:1-11.
73. Worsley, K.J., Evans, A.C., Marrett, S. & Neelin, P. (1992). A three-dimensional statistical analysis for CBF activation studies in human brain. *Journal of Cerebral Blood Flow and Metabolism*, **12**:900-918.
74. Evans, A.C., Marrett, S., Neelin, P., Collins, L., Worsley, K.J., Dai, W., Milot, S., Meyer, E. & Bub, D. (1992). Anatomical mapping of functional activation in stereotactic coordinate space. *Neuro Image*, **1**:43-53.
75. Worsley, K.J., Evans, A.C., Strother, S.C., & Tyler, J.L. (1991). A linear spatial correlation model, with applications to positron emission tomography. *Journal of the American Statistical Association*, **86**:55-67.
76. Worsley, K.J., Tyler, J.L., Strother, S.C., Zattore, R.J., Alivisatos, B., Diksic, M. & Yamamoto, Y.L. (1989). Modelling the spatial correlation structure of regional cerebral glucose metabolism from PET. *Journal of Cerebral Blood Flow and Metabolism*, **9**:S729.
77. Hakim, A.M., Berger, L., Kuwabara, H., Worsley, K., Marchal, G., Biel, C., Evans, A.C., Diksic, M. & Meyer, E. (1989). The effect of nimodipine treatment on the evolution of human cerebral infarction studied by PET. *Journal of Cerebral Blood Flow and Metabolism*, **9**:S316.

78. Hakim, A.M. Evans, A.C., Berger, L., Kuwabara, H., Worsley, K., Marchal, G., Biel, C., Pokrupa, R., Diksic, M., Meyer, E., Gjedde, A. & Marrett, S. (1989). The effect of nimodipine on the evolution of human cerebral infarction studied by PET. *Journal of Cerebral Blood Flow and Metabolism*, **9**:523-534.
79. Worsley, K.J. (1988). Exact percentage points of the likelihood ratio test for a change-point hazard rate model. *Biometrics*, **44**:259-263.
80. Tyler, J.L., Worsley, K.J., Gloor, P., Ochs, R. & Hakim, A.M. (1988). Remote hypermetabolic effects of seizure disorders. *Journal of Nuclear Medicine*, **29**:920-921.
81. Tyler, J.L., Strother, S.C., Zatorre, R.J., Alivisatos, B., Worsley, K.J., Diksic, M. & Yamamoto, Y.L. (1988). Stability of regional cerebral glucose metabolism in the normal brain measured by PET. *Annals of Neurology*, **22**:631-642.
82. Nakai, H., Yamamoto, Y.L., Diksic, M., Worsley, K.J., & Takara, E. (1988). Triple-tracer autoradiography demonstrates effects of hyperglycemia on cerebral blood flow, pH, and glucose utilization in cerebral ischemia of rats. *Stroke*, **19**:764-772.
83. Ochs, R., Gloor, P., Tyler, J.L., Wolfson, T., Worsley, K.J., Andermann, F., Diksic, M., Myer, E. & Evans, A. (1987). Effect of generalized spike and wave discharge upon glucose metabolism measured by positron emission tomography (PET). *Annals of Neurology*, **21**:458-464.
84. Worsley, K.J. (1987). Un exemple d'indentification d'un modèle log-linéaire grâce à une analyse des correspondances. *Revue de Statistique Appliquée*, **35**:13-20.
85. Worsley, K.J. (1986). Confidence regions and tests for a change-point in a sequence of exponential family random variables. *Biometrika*, **73**:91-104.
86. Srivastava, M.S. & Worsley, K.J. (1986). Likelihood ratio tests for a change in the multivariate normal mean. *Journal of the American Statistical Society*, **81**:199-204.
87. Worsley, K.J. (1984). Testing for lung damage to firefighters at the Mississauga train derailment. *Canadian Journal of Statistics*, **12**:16-21.
88. Worsley, K.J. (1983). Testing for a two-phase multiple regression. *Technometrics*, **25**:35-42.
89. Worsley, K.J. (1983). The power of likelihood ratio and cumulative sum tests for a change in a binomial probability. *Biometrika*, **70**:455-464.
90. Worsley, K.J. (1982). An improved Bonferroni inequality and applications. *Biometrika*, **69**:297-302.
91. Hanify, J.A., Metcalf, P., Nobbs, C.L. & Worsley, K.J. (1981). Aerial spraying of 2,4,5-T and human birth malformations: An epidemiological investigation. *Science*, **212**:349-351.
92. Hanify, J.A., Metcalf, P., Nobbs, C.L. & Worsley, K.J. (1980). Congenital malformations in the newborn in Northland: 1966-1977. *The New Zealand Medical Journal*, **92**:245-248.
93. Worsley, K.J. (1979). On the likelihood ratio test for a shift in location of normal populations. *Journal of the American Statistical Association*, **74**:365-367.
94. Worsley, K.J. (1977). A non-parametric extension of a cluster analysis method of Scott and Knott. *Biometrics*, **33**:532-535.

Refereed conference proceedings

95. Carbonell, F., Worsley, K.J., Trujillo, N., Sotero, R.S., Hernandez, M. (2007). Detecting time-varying connectivity. *NeuroImage*, **36**:255 M-AM.
96. Worsley, K.J., Charil, A., Smith, F., Schyns, P. (2007). Detecting connectivity between images: MS lesions, cortical thickness, and the 'bubbles' task in fMRI. *NeuroImage*, **36**:303 M-AM.
97. Bellec, P., Perlberg, V., Benali, H., Worsley, K.J., Evans, A.C. (2007). Realistic fMRI simulations using parametric model estimation over a large database (ICBM FRB). *NeuroImage*, **36**:345 TH-AM.
98. Taylor, J.E. & Worsley, K.J. (2006). Detecting fMRI activation allowing for unknown latency of the hemodynamic response. *NeuroImage*, **31**:252 T-PM.
99. Worsley, K.J. (2006). Recovering the information in the drift of fMRI data. *NeuroImage*, **31**:268 T-PM.
100. **Chamandy, N.**, Worsley, K.J. & Taylor, J.E. (2006). A 'tilted' P-value approximation for non-Gaussian random fields, with application to lesion density image data. *NeuroImage*, **31**:260 T-PM.
101. Rohani, F., Adler, R.J., Taylor, J.E. & Worsley, K.J. (2006). Confidence sets for the SPM contours. *NeuroImage*, **31**:263 T-AM.
102. Worsley, K.J., Charil, A., Lerch, J. & Evans, A.C. (2005). Connectivity of anatomical and functional MRI data. *2005 International Joint Conference on Neural Networks, July 31-August 4, 2005, Montreal, Quebec, Canada*.
103. Worsley, K.J. (2005). Spatial smoothing of autocorrelations to control the degrees of freedom in fMRI analysis. *Neuroimage*, **26**:610 M-PM.
104. **Chamandy, N.**, Steele, R. & Worsley, K.J. (2005). Bayesian Hierarchical Models for Thresholding the Principal Component Loadings of High-Dimensional Data, With Application to Brain Imaging. *Neuroimage*, **26**:718 T-AM.
105. Worsley, K.J. (2005). An improved theoretical P-value for SPMs based on discrete local maxima. *Neuroimage*, **26**:539 T-AM.
106. Purkayastha, S., Goldman, R.I. & Worsley, K.J. (2005). Statistical Analysis of Simultaneous EEG-fMRI Data by Variable Selection. *Neuroimage*, **26**:601 M-AM.
107. Taylor, J.E., Worsley, K.J., Brett, M., Cointepas, Y., Hunter, J., Millman, J., Poline, J-B. & Perez, F. (2005). BrainPy: an open source environment for the analysis and visualization of human brain data. *Neuroimage*, **26**:763 T-AM.
108. Worsley, K.J., Taylor, J.E. & Tomaiuolo, F. (2004). Roy's maximum root and maximum canonical correlation SPMs from multivariate multiple regression analysis of imaging data. *Neuroimage*, **22**:WE393.
109. Purkayastha, S., Goldman, R.I., & Worsley, K.J. (2004). Statistical analysis of simultaneous EEG-fMRI data. *Neuroimage*, **22**:WE123.
110. Boada, F., Collins, L., Drobniak, I., Eddy, W., Evans, A., Griffin, M., Jenkinson, M., Noll, D., Pike, B., Shi, H., Shroff, D., Stenger, V. & Worsley, K.J. (2004). MIDAS - A multi-site fMRI simulator consortium. *Neuroimage*, **22**:WE249.

111. Tomaiuolo, F., Worsley, K.J., Lerch, J., Di Paola, M., Carlesimo, A., Bonanni, R., Caltagirone, C. & Paus, T. (2004). Long-term consequences of severe non-missile traumatic brain injury in white matter: An in vivo T1 weighted MRI computational analysis study. *Neuroimage*, **22**:TH392.
112. Chung, M.K., Worsley, K.J., Robbins, S. & Evans, A.C. (2003). Tensor-based brain surface modeling and analysis. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, **1**:467-473.
113. Chung, M.K., Worsley, K.J., Robbins, S., Paus, T., Giedd, J.N., Rapoport, J.L. & Evans, A.C. (2003). Detecting gray matter maturation via tensor-based surface morphometry. *NeuroImage*, **19**:S807.
114. Taylor, J., Knuston, B. & Worsley, K.J. (2003). Incorporating spatial information into FDR thresholding of SPMs. *NeuroImage*, **19**:S956.
115. Taylor, J. & Worsley, K.J. (2003). Thresholding correlated conjunctions. *NeuroImage*, **19**:S957.
116. Worsley, K.J. (2002). Non-stationary FWHM and its effect on statistical inference for fMRI data. *NeuroImage*, **15**:S346.
117. **Awissi, M.**, MacGibbon, B. & Worsley, K.J. (2002). Denoising of fMRI images by wavelet thresholding. *NeuroImage*, **15**:S348.
118. Charil, A., Narayanan, S., Worsley, K.J., Evans, A.C., Arnold, D.L. & Dagher, A. (2002). Correlation between lesion location and performance on the paced auditory serial addition test (PASAT) in relapsing -remitting multiple sclerosis. *NeuroImage*, **15**:S736.
119. Watkins, K., Paus, T., Mangin, J-F., Zijdenbos, A., Collins, L., Lerch, J., Worsley, K.J., Blumenthal, J., Giedd, J. & Rapoport, J. (2002). Maturation of white matter tracts during adolescence: a longitudinal MRI study. *NeuroImage*, **15**:S762.
120. Riera, J., Valdes, P., Aubert, E., Evans, A.C. & Worsley, K.J. (2002). Alpha rhythm source activation and connectivity. *NeuroImage*, **15**:S521.
121. **Aston, J.A.D.**, Worsley, K.J. & Gunn, R.N. (2001). RPM STATISTICS - A statistical tool for receptor parametric mapping. *NeuroImage*, **13**:S65.
122. **Bellera, C.**, Paus, T., Worsley, K.J., Giedd, J.N., Rapoport, J.L., Zijdenbos, A., Pausova, Z. and Evans, A.C. (2001). Assessment of voxel-based heritability of white and gray matter density using the intraclass correlation coefficient. *NeuroImage*, **13**:S78.
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126. **Liao, C.**, Worsley, K.J., Poline, J-B., Duncan, G.H. & Evans, A.C. (2001). Estimating the delay of the hemodynamic response in fMRI data. *NeuroImage*, **13**:S185.

127. Riera, J.J., Valdés, P.A., Aubert, E., Evans, A. & Worsley, K.J. (2001). An analysis of brain sources and connectivity patterns associated with alpha rhythm reactivation in human. *NeuroImage*, **13**:S233.
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145. Poline, J.B., Worsley, K.J., Evans, A.C. & Friston, K.J. (1997). Issues in the use of two multivariate analyses for fMRI data. *NeuroImage*, **5**:S472.
146. **Cao, J.**, Worsley, K.J., **Liu, C.**, Collins, L. & Evans, A.C. (1997). New statistical results for the detection of brain structural and functional change using random field theory. *NeuroImage*, **5**:S512.
147. Kiebel, S.J., Poline, J-B, Holmes, A.P., Worsley, K.J., Frackowiak, R.S.J. & Friston, K.J. (1996). Robust smoothness estimation in statistical parametric maps using residuals from the general linear model. *NeuroImage*, **3**:S69.
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149. MacDonald, D., Worsley, K.J., Avis, D. & Evans, A.C. (1996). Surface segmentation and matching by 3D deformation. *NeuroImage*, **3**:S253.
150. Poline, J-B., Worsley, K.J., Evans, A.C. & Friston, K.J. (1996). Testing for activations using both signal peak intensity and spatial extent. *NeuroImage*, **3**:S254.
151. Paus, T., Perry, D.W., Zatorre, R.J., Worsley, K.J. & Evans, A.C. (1996). Modulation of cerebral blood-flow in the human auditory cortex during speech: role of motor-to-sensory discharges. *NeuroImage*, **3**:S452.
152. Kiebel, S.J., Poline, J-B, Holmes, A.P., Worsley, K.J., Frackowiak, R.S.J. & Friston, K.J. (1996). Robust smoothness estimation in statistical parametric maps using residuals from the general linear model. *NeuroImage*, **3**:S69.
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157. Worsley, K.J., Marrett, S., Neelin, P. & Evans, A.C. (1995). A unified statistical approach for determining significant signals in location and scale space images of cerebral activation. *Quantification of brain function using PET*, Eds. R. Myers, V.J. Cunningham, D.L. Bailey & T. Jones, Academic Press, San Diego.
158. Worsley, K.J. (1986). Confidence regions and tests for a change-point in a sequence of exponential random variables. *Proceedings of the Pacific Statistical Congress*, Elsevier Science Publishers B.Vd. (North-Holland), Amsterdam.

Other refereed publications

159. Worsley, K.J. (2004). Developments in random field theory. In *Human Brain Function*, Eds. R. Frackowiak, K. Friston, C. Frith, R. Dolan, C. Price, S. Zeki, J. Ashburner & W. Penny. Academic Press, pp. 881-886.
160. Worsley, K.J. (2001). Statistical analysis of activation images. In *Functional MRI: An Introduction to Methods*, Eds. P. Jezzard, P.M. Matthews, S.M. Smith. Oxford University Press, pp. 251-270.
161. **Cao, J.** & Worsley, K.J. (2001). Applications of random fields in human brain mapping. In *Spatial Statistics: Methodological Aspects and Applications*, Ed. M. Moore, Springer Lecture Notes in Statistics, **159**:169-182.
162. Worsley, K.J. (2001). Gaussian random fields. In *Encyclopedia of Environmetrics*, Eds. A.H. El-Shaarawi and W.W. Piegorisch. John Wiley and Sons.
163. Worsley, K.J. (2000). Comment on 'A Bayesian time-course model for functional magnetic resonance imaging data' by C. Genovese. *Journal of the American Statistical Association*, **95**:691-719.
164. Worsley, K.J. (1997). Discussion of 'Non-linear Fourier time series analysis of brain mapping by fMRI' by Lange and Zeger. *Applied Statistics, Journal of the Royal Statistical Society Series C*, **46**:25-26.
165. Worsley K.J., Evans, A.C., Marrett, S. & Neelin, P. (1993). A three dimensional statistical analysis for CBF activation studies in human brain (comment). *Journal of Cerebral Blood Flow and Metabolism*, **13**:1040-1042.
166. Worsley, K.J., Stylian, G.P.H. & Bérubé, J. (1991). Genstat ANOVA efficiency factors and canonical efficiency factors for non-orthogonal designs. *Genstat Newsletter*, **26**:11-21.
167. Worsley, K.J. (1990). The inefficiency of the recovery of interblock information about non-orthogonal treatments from Genstat ANOVA. *Genstat Newsletter*, **25**:51-56.
168. Worsley, K.J. (1989). Discussion of "A combined approach to contingency table analysis". *Applied Statistics*, **38**:284-286.
169. Worsley, K.J. (1989). Comment on: "Testing for a change-point in registry data with an example on hypospadias." *Statistics in Medicine*, **8**:1414-1415.
170. van der Heyden, P.G.M. & Worsley, K.J. (1988). Comment on "Correspondence analysis used complementary to log-linear analysis". *Psychometrika*, **53**:287-291.
171. Worsley, K.J. (1985). Letter to the editor: "Bonferroni (improved) wins again." *The American Statistician*, **19**:235.

Articles submitted to refereed journals

172. **Carbonell, F.**, Worsley, K.J., Trujillo-Barreto, N.J. & Vega-Hernandez, M. (2007). The geometry of time-varying cross correlation random fields. *Annals of the Institute of Statistical Mathematics*, submitted.
173. Taylor, J.E. & Worsley, K.J. (2007). Detecting sparse cone alternatives for Gaussian random fields, with an application to fMRI. *Annals of Statistics*, under revision.

Contributions to the Training of Highly Qualified Personnel, 1997-

Principal or joint supervisor:

1. **Farzan ROHANI**, PhD, 2004-, *Random fields*.
2. **Nicholas CHAMANDY**, PhD, 2004-2007, *Classification of random field data*, (joint with Russell Steele), now at Google Inc.
3. **Mohammed AL-ODAT**, PhD, 2001-2004, *Detecting conjunctions using cluster volumes*, (joint with Alain Vandal), now Professor, Yarmouk University, Jordan.
4. **Jonathan TAYLOR**, PhD, 1998-2001, *Euler characteristics for Gaussian fields on manifolds* (joint with Robert Adler, Technion, Israel), now Associate Professor, Department of Statistics, Stanford.
5. **John ASTON**, PhD, 1999-2002, *Statistical methods for functional neuroimaging data* (joint with Roger Gunn, Imperial College, London, and MNI, McGill), now Researcher, Academia Sinica, Taiwan.
6. **Moo CHUNG**, PhD, 1998-2001, *Statistical morphometry in neuroanatomy* (joint with Jim Ramsay, Psychology), now Associate Professor, Department of Biostatistics and Medical Informatics, University of Wisconsin at Madison.
7. **Madon AWISSI**, MSc, 1998-2001, *Détection dans les images IRM d'un signal par la méthode des ondelettes*. (joint with Brenda MacGibbon, UQAM), now Chargée de Cours, Département de Mathématiques, Université de Qu'ebec à Moncton.
8. **Chuanhong LIAO**, MSc, 1999-2001, *Estimating the delay of the hemodynamic response in fMRI data*, now Senior Statistician, JSS Medical Research, Montreal.
9. **Carine BELLERA**, MSc, 1999-2001, *Detecting heritability of brain structure using magnetic resonance imaging*, now Statistician, Montreal General Hospital.
10. **Li MA**, MSc, 1997-1999, *Inference for localized signals in a Gaussian random field, with applications to brain mapping*, now graduate student in Computer Science, Waterloo.
11. **Khalil SHAFIE**, PhD, 1994-1998, *The geometry of Gaussian rotation space random fields*, now Associate Professor, Department of Applied Statistics and Research Methods, University of Northern Colorado.
12. **Jin CAO**, PhD, 1994-1997, *Excursion sets of random fields with applications to human brain mapping*, now researcher at Bell Laboratories (Lucent Technologies), Murray Hill, New Jersey.

Thesis Committee:

13. **Michel ADES**, PhD, 1990-1997, supervisor Peter Caines (Electrical Engineering)
14. **Lishuen FU**, PhD, 1993-1998, supervisor Tina Wolfson (Epidemiology and Biostatistics)

Post-doctoral fellows:

15. **Ester YAN**, Post-doctorate, 1997, *Analysis of brain images*
16. **Craig LIU**, Post-doctorate, 1996-1997, *Analysis of brain images*

Other Evidence of Impact and Contributions, 2003-

Awards, fellowships and research fellowships:

- Gold Medal, Statistical Society of Canada, 2004.
- Royal Society of Canada, Fellowship, 2003-.
- Killam Research Fellowship, *Statistics of Brain Mapping*, 2000-2002.

Editorial boards

- *NeuroImage* 1995-, Methods Section Editor 2005-
- *Human Brain Mapping* 1995-
- *Annals of the Institute of Statistical Mathematics* 2003-
- *Biometrics* 2004-
- *Annals of Statistics* 2006-
- *Statistica Sinica* 2006-2008
- *Atlantic Electronic Journal of Mathematics* 2006-
- *Journal of Mathematical Imaging and Vision* 2007-
- *Sankhya, Series B* 2008-

Conference boards

- *Organization for Human Brain Mapping*, Elected Chair of Program Committee, Chicago, June 2007 and Sydney, June 2008.
- *Bernoulli Society World Congress and Institute of Mathematical Statistics Annual Meeting (BCIMS08)*, Program Committee, Singapore, July 2008.

Prestigious invited lectures (conferences only):

2008

1. Invited speaker and organizer, IPAM/CCB Summer School on Mathematics in Brain Imaging, UCLA, Los Angeles, CA, July 14-25, 2008
2. Invited speaker and organizer, Bernoulli World Congress, Singapore, July 14-19, 2008.
3. Invited speaker, First IMS-China International Conference on Statistics and Probability, Hangzhou, China, June 11-13, 2008.
4. Invited speaker, Brain Imaging Workshop, Mathematical Biosciences Institute, Ohio State University, June 9-13, 2008.
5. Invited speaker, Swedish National Winter Course in Statistics, Umea University, Sweden, March 2-6, 2008.
6. Keynote speaker, Visionary Lecture Series, Indian Statistical Institute, Kolkata, India, January 1-4, 2008.
7. Plenary speaker, Conference on Statistical Paradigms: Recent Advances and Reconciliations, Platinum Jubilee of the Indian Statistical Institute, Kolkata, India, January 1-4, 2008.

2007

8. Invited speaker, Workshop on Mathematical Methods for Medical Image Analysis, Banff International Research Station, November 4-9, 2007.
9. Plenary lecture, Korean Society for Human Brain Mapping Annual Meeting, Seoul, South Korea, November 2, 2007.
10. Invited speaker, Geometric and Topological Approaches to Data Analysis Workshop, October 8-12, University of Chicago, IL.
11. Invited speaker, International Statistical Institute, August 22-29, Lisbon, Portugal.

12. Invited speaker, Joint Statistical Meetings, July 29 - August 2, Salt Lake City, Utah.
13. Invited speaker, Annual Meeting of the Society for Mathematical Psychology, July 25-28, University of California, Irvine, CA.
14. Invited speaker, SAMSI Summer Program on the Geometry and Statistics of Shape Spaces, July 7-13, Raleigh, NC.
15. Invited speaker, ICSA 2007 Applied Statistics Symposium, June 3-6, Raleigh, NC.
16. Invited speaker, IPAM Workshop IV: Image Processing for Random Shapes: Applications to Brain Mapping, Geophysics and Astrophysics, May 21-25, UCLA, CA.
17. Invited course, The 15th International Conference on Interdisciplinary Mathematical and Statistical Techniques, May 20-23, Shanghai (declined).
18. Keynote speaker, Israel Statistical Association Annual Meeting, May 14-16, Israel (declined).
19. Invited speaker, Informatica 2007, II International Congress of Bioinformatics and Neuroinformatics, February 16, Havana, Cuba (declined).
20. Invited speaker, Sleep Research Society Primer Course, February 9-11, La Jolla, CA (declined).
21. Invited speaker, LIAMA 10th Anniversary Satellite Symposium on Brain Imaging and Cognitive Disorders, January 19, Beijing.

2006

22. Invited Speaker, International Conference on Multivariate Statistical Methods in honour of S.N. Roy, December 28-29, Kolkata, India (declined).
23. Invited speaker, International Workshop on Medical Imaging and Augmented Reality (MIAR04), Shanghai, August 17-18, 2006.
24. Invited speaker, IMS Annual Meeting and X Brazilian School of Probability (XEBP), Rio de Janeiro, Brazil, July 30 - August 4, 2006.
25. Invited speaker, Western North American Region of The International Biometric Society Meeting, Flagstaff, Arizona, June 27-30, 2006.
26. Conference organizer, Statistics at the Frontiers of Science, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), Banff, Alberta, June 24-29, 2006.
27. Invited speaker, Statistical Society of Canada, University of Western Ontario, London, Ontario, May 28-31, 2006.
28. Invited speaker, Interface 2006, 38th Symposium on the interface of statistics, computing science, and applications. Pasadena, California, May 24-27, 2005.
29. Invited Speaker, Functional Brain Imaging Research Network (FBIRN) workshop, Irvine, California, March 13-14, 2006.

2005

30. Invited speaker, Fields Workshop, Grand Mathematical Challenges of Medical Image Processing, Waterloo, Ontario, October 21-23, 2005.
31. Invited speaker, Pacific Northwest Statistics Meeting, University of British Columbia, Okanagan, October 1, 2005.
32. Invited Speaker, Joint Statistics Meeting, Minneapolis, August 7-11, 2005.
33. Invited speaker, International Joint Conference on Neural Networks, Montreal, July 31-August 4, 2005.

34. Plenary speaker, European Meeting of Statisticians, Oslo, July 24-28, 2005.
35. Gold Medal Address, Statistical Society of Canada Annual Meeting, Saskatoon, Canada, June 12-16, 2005.
36. Invited Speaker, Workshop on Mini-invasive Procedures in Medicine and Surgery: Mathematical and Numerical Challenges, CRM, Université de Montréal, May 16-27, 2005.
37. Invited Speaker, Conference in honour of the 25th anniversary of GERAD, HEC, Université de Montréal, May 12-13.
38. Invited Speaker, ENAR annual meeting of the American Statistical Association, Austin, Texas, March 20-23, 2005.
39. Invited speaker, 3e Cycle Romand de Statistique et de Probabilités Appliquées, Séminaire de Printemps, Villars-sur-Ollon, Switzerland, February 27 - March 2, 2005.
40. Invited speaker, Regroupement Provincial de Recherche en Imagerie Cérébrale fMRI Workshop, Université de Montréal, January 6-8, 2005.

2004

41. Invited speaker, Multiscale Geometric Methods in Astronomical Data Analysis Workshop, Institute for Pure and Applied Mathematics, University of California, Los Angeles, November 8-12, 2004.
42. Invited speaker, International Workshop on Medical Imaging and Augmented Reality (MIAR04), Beijing, August 19-20, 2004.
43. Invited speaker, Bernoulli Society and IMS Meeting, Barcelona, July 26-31, 2004.
44. Invited speaker, Mathematics in Brain Imaging Workshop, Institute for Pure and Applied Mathematics, University of California, Los Angeles, July 12-23, 2004.
45. Invited speaker, Interface 2004: Computational Biology and Bioinformatics 36th Symposium on the Interface, Baltimore, Maryland, May 26-29, 2004.
46. Invited speaker, Brain Connectivity Workshop, Havana, Cuba, April 26-29, 2004.
47. Invited speaker, Mathematical Biosciences Institute, Ohio State University, Columbus, Ohio, March 18-20, 2004.
48. Invited speaker, Journée scientifique annuelle de REPRIC, McGill University, January 30, 2004.

2003

49. Invited speaker, Cerebral Plasticity: Imaging and Modeling Workshop, Centre de Recherches Mathématiques, Université de Montréal, October 30-31, 2003
50. Invited speaker, Royal Society of Canada, Fields Institute, Toronto, October 24, 2003.
51. Invited speaker, Joint Statistics Meeting, San Francisco, August 3-7, 2003.
52. Invited speaker, International Society for Magnetic Resonance in Medicine, Annual Meeting, Toronto, July 12-16, 2003.
53. Inaugural Address, Data Mining Workshop, University College, London, UK, June 6-7, 2003.
54. Invited speaker, Finnish Summer School on Probability Theory, Nagu, Finland, June 2-6, 2003.
55. P.C. Mahalanobis Lecturer, Indian Statistical Institute, Kolkata, Bangalore, Delhi, March 17-28, 2003.