

Thomas E. Nichols

Curriculum Vitae

General Information

Professor, Wellcome Trust Senior Research Fellow
Department of Statistics & Warwick Manufacturing Group
University of Warwick
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United Kingdom

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Education

Ph.D. in Statistics, Carnegie Mellon University, 2001.
Thesis title: Spatiotemporal Modeling of Positron Emission Tomography.
Thesis advisor: William F. Eddy.
Certificate, Graduate Training Program, Center for the Neural Basis of Cognition, Carnegie Mellon University & University of Pittsburgh, 1999.
M.S. in Statistics, Carnegie Mellon University, 1997.
B.S. in Mathematics and Statistics, Carnegie Mellon University, 1992.

Employment

Professor; Head of Neuroimaging Statistics Department of Statistics & Warwick Manufacturing Group, University of Warwick, 2014 –.

Principal Research Fellow, Head of Neuroimaging Statistics Department of Statistics & Warwick Manufacturing Group, University of Warwick, 2009 – 2014.

Senior Research Fellow Functional Magnetic Resonance Imaging of the Brain (fMRIB) Centre, Department of Clinical Neurology, University of Oxford, 2006 –.

Director; Modelling & Genetics Clinical Imaging Centre, GlaxoSmithKline, 2006 – 2009.

Adjunct Research Associate Professor Department of Biostatistics, School of Public Health, University of Michigan, 2006 – 2009.

Associate Professor Department of Biostatistics, School of Public Health, University of Michigan, 2006.

Assistant Professor Department of Biostatistics, School of Public Health, University of Michigan, 2000 – 2006.

Consultant Advisor on statistical and methodological problems in Positron Emission Tomography (PET) and Functional Magnetic Resonance Imaging (fMRI), 1996 –.

Applications Programmer and Statistician University of Pittsburgh Medical Center PET Facility. Developed software and methods to analyze PET data. Advised investigators on design and analysis of PET studies. 1992 – 1996.

Awards & Honours

Thompson-Reuter's Highly Cited Researcher, 2014 (for influence of my publications 2002–2012).

Wiley Young Investigator Award winner, Organization for Human Brain Mapping, 2009.

Elected Fellow, American Statistical Association, 2012.

Grants
(Current)

“Transforming statistical methodology for neuroimaging meta-analysis”, Wellcome Trust, 100309/Z/12/Z, June 2013 – May 2018. 100% effort + 2 PDRA, £1.1m.

“SOLAR-Eclipse Computational Tools for Imaging Genetics”, NIH R01 EB015611-04, Sept 2016 – Aug 2020, 10% effort + PDRA. P.I. Peter Kochunov, University of Maryland, £305,591 (Warwick subcontract).

“Bayesian Spatial Point Process Modeling of Neuroimage Data”, NIH R01 NS075066-01A1, Apr 2012 – Dec 2016, 25% effort + PhD. P.I. Timothy Johnson, University of Michigan, £287,053 (Warwick subcontract).

“Integrated Multimodal Brain Imaging for Neuroscience Research and Clinical Practice”, Wellcome Trust Strategic Award, 098369/Z/12/Z, Sept 2012 – Aug 2017, 5% effort. P.I. Stephen Smith, Oxford University, £20,475 (Warwick subcontract).

“Personalised Medicine through Learning in the Model Space”, EPSRC N1747005, Oct 2013 – Sept 2016, PDRA. P.I. Peter Tino, University of Birmingham, £199,659 (Warwick subcontract).

Grants
(Previous)

“Inside-out: Statistical methods for Computed Tomography validation of complex structures in Additive Layre Manufacturing”, EPSRC, EP/K031066/1, Oct 2013 – Sep 2016, 5% effort. P.I. Wilfrid Kendall, £639,264.

“SOLAR-Eclipse Computational Tools for Imaging Genetics”, NIH R01 EB015611-01, July 2012 – April 2016, 15% effort. P.I. Peter Kochunov, University of Maryland, £141,291 (Warwick subcontract).

“Human Connectome Project”, NIH U54 MH091657-03, September 2010 – September 2015. 6% effort, P.I. David Van Essen, Washington University at St. Louis, £45,531 (Warwick subcontract).

“Optimal Fixed and Adaptive Designs for fMRI Clinical Trials”, G1100188, MRC CASE Industrial PhD Studentship in Statistics, joint with GlaxoSmithKline’s Prof. Ed Bullmore. Oct 2011 – Sept 2015. Covers fees, topped-up stipend & training expenses, £92,838.

“Skills Gap Award”, MRC G0900908, Aug 2009 – July 2012. 66% effort, P.I. Thomas Nichols, £249,990.

“Nonparametric Inference for Neuroimaging Data”, NIH 1 R01 MH069326, 2004 – 2008. 50% effort, P.I. Thomas Nichols, \$175,000.

“PET Study of Biochemistry and Metabolism of the CNS”, NIH P01 NS 15655, 2001–2006. 20% effort, P.I. Kirk Frey, \$21,492 (subaccount).

“Elimination of Head Movement Artifact in fMRI”, NIH/NIBIB 1 R01 EB002683, 2003–2005, 10% effort, P.I. Noll \$10,951 (subaccount).

“Advancing PET Science for New Measures of Brain Function”, Department of Energy DE-FG01-87ER60561, 2003–2005, 10% effort, P.I. Michael Kilburn, \$10,103 (subaccount).

“Neurochemical Mediation of Placebo Responses in Humans”, NIH 1 R01 AT001414, 2003–2008, 5% effort, P.I. Zubieta, \$4,199 (subaccount).

“Neurochemical Endophenotype Responses to Pain Stress”, NIH 1 R01 DA016423, 2004–2008, 5% effort, P.I. Zubieta, \$4,413 (subaccount).

“Mu-Opioid Mediated Stress Regulation in BPD”, NIH 1 R21 MH069612, 2004–2007, 2% effort, P.I. Zubieta, \$125,000.

“Neurocognitive Risk for Alcoholism into Adulthood”, NIH 1 R01 AA012217, 2005–2010, 10% effort, P.I. Zucker, \$6,473 (subaccount)

“Fast, Quantitative, Perfusion-Based functional-MRI”, NIH 1 R01 EB004346, 2005–2008, 7% effort, P.I. Hernandez, \$20,002 (subaccount)

“Alzheimer’s Disease Neuroimaging Initiative”, NIH, 2005–2006, 0% effort, \$37,096, P.I. Weiner/Koeppel.

“Training in Functional Magnetic Resonance Imaging”, NIH, 2005–2010, 33% of August, P.I. Jonides, \$133,517.

“Imagery, Visual Memory & Aging: A Neuroimaging Approach”, NIH R01 AG06265, 2002–2004, 7% effort, P.I. Denise Park.

“Automatic 3D registration for Enhanced Cancer Management Statistics Core”, NIH/NCI P01 CA87634, 2002–2007, 5% effort, P.I. Chuck Meyer.

Teaching Experience

Instructor, “Probabilistic and Statistical Inference”, University of Warwick Complexity Sciences, Term 2, 2012-2013.

Co-Instructor, “Advanced Topics in Biostatistics”, University of Warwick Statistics. Term 1, 2012-2013.

Co-Instructor, “Advanced Topics in Biostatistics”, University of Warwick Statistics. Term 1, 2011-2012.

Co-Instructor, “Advanced Topics in Biostatistics”, University of Warwick Statistics. Term 1, 2010-2011.

Instructor, “Applied Biostatistics”, University of Michigan Biostatistics. Fall 2002, Fall 2003, Fall 2004, Fall 2005.

Instructor, “Introduction to Biostatistics”, University of Michigan Biostatistics (600). Fall 2003, Fall 2004.

Instructor, “Introduction to fMRI”, University of Michigan Biostatistics. Summer 2001, Summer 2002, Summer 2004, Summer 2005.

Instructor, “Biostatistics” (for non-residential clinical program), University of Michigan Biostatistics. Fall-Winter 2001.

Instructor, “Applied Statistics I: Linear Regression”, University of Michigan Biostatistics. Fall 2000, Fall 2001.

NSF VIGRE Teaching Fellow, “Introduction to Statistical Reasoning”, CMU Statistics. Fall 1999.

Short Courses Organized

TE Nichols. *SPM Short Course*. Three-day short course, UBC Brain Research Centre, University of British Columbia, Vancouver, August 5 - 7, 2010.

K Kiehl, V Calhoun, TE Nichols. *fMRI Image Acquisition and Analysis Course*. Three-day short course, Olin Neuropsychiatry Research Center, Institute of Living, Hartford, August 4 - 7, 2005, November 9 - 11, 2005, March 30 - April 1, 2006.

K Kiehl, TE Nichols. *USA SPM Short Course*. Three-day short course, Yale University, April, 2005.

TE Nichols. *Basic & Advanced Group Modeling for fMRI*. Half-day short course. Department of Statistics, Southern Methodist University, February 18, 2005.

TE Nichols. *Current Topics in the Statistical Analysis of fMRI Data*. Full-day short course, Department of Psychology, Columbia University, February 4, 2005.

TE Nichols. *Modeling & Inference of fMRI data w/ SPM*. Two-day short course, Beckman Institute, University of Illinois, Champaign-Urbana, July 2003.

TE Nichols. *Under the Hood of Statistical Parametric Mapping: SPM96, SPM97 & SPM99*. Two day short-course, Cognitive Science and Cognitive Neuroscience Program, University of Michigan, Ann Arbor. October 1999.

Professional Activities

Alan Turing Institute

Faculty Fellow, 2016 –

Co-organiser, “Alan Turing Institute Symposium on Reproducibility for Data Intensive Research”, Oxford, 6-7 April 2016.

Co-organiser, “Alan Turing Institute High Value Manufacturing Data Summit”, The Shard, 9 March 2016.

American Statistical Association (ASA)

Co-founder, Section on Statistics in Imaging (2011).

President, Ann Arbor Chapter, 2005 – 2006.

Organizer, *Mixed Models, Longitudinal and Incomplete Data* Short Course, Molenberghs & Verbeke speakers, sponsored by Ann Arbor Chapter & UM CSCAR. 90 registrants. Ann Arbor, MI, March 2005

Vice-President, Ann Arbor Chapter of ASA, 2002 – 2005

Student of the Year, Pittsburgh Chapter of the ASA, 2000

Member, 1999 –

Functional Biomedical Informatics Research Network (FBIRN)

Member, Statistics External Advisory Committee.

International Biometrics Society (ENAR)

Member, 2001-

International Society for Magnetic Resonance in Medicine (ISMRM)

Co-organizer, *fMRI Data Analysis* Morning Categorical Course, with S Smith. 10th Scientific Meeting, 2002

Member, 2001 – 2014.

Institute of Electrical and Electronics Engineers (IEEE)

Co-organizer, *Statistical Modeling and Inference of fMRI Data* tutorial, with K Worsley. IEEE International Symposium on Biomedical Imaging, 2004

Attendee, IEEE EMBS International Summer School on Biomedical Imaging. 1998

Institute for Mathematical Statistics (IMS)

Member, 1999 –

Institute for Pure and Applied Mathematics, University of California Los Angeles

Co-organizer, *Mathematics in Brain Imaging* 2 week Graduate Summer School, with M Miller, R Poldrack, J Taylor, P Thompson, & K Worsley. July 2008

Co-organizer, *Mathematics in Brain Imaging* 2 week Graduate Summer School, with P Thompson, M Miller, R Poldrack & S Osher. July 2004

Laboratory of Neuro Imaging Resource (LONIR), University of Southern California

Member, Scientific Advisory Board, 2013–.

Medical Image Computing and Computer Assisted Intervention (MICCAI) Society

Co-organizer, *Statistical perspective on fMRI data analysis: Beyond Mass-Univariate Modelling* workshop, with B Thirion, A Roche & P Ciuciu. 12th International Conference, London, 2010.

Organization for Human Brain Mapping (OHBM)

Chair, Committee on Best Practice in Data Analysis and Sharing, 2014 – 2016.

Ad hoc member, Program Committee of OHBM, 2014 – 2016.

Elected Secretary, Governing Council of OHBM, 2013 – 2014.

Co-organizer, *Neuroimaging Meta Analysis* Educational Course, with S Eickhoff. 19th–22st Annual Meetings, 2013 – 2016

Co-organizer, *Imaging Genetics* Educational Course, with J-B Poline. 16th–21st Annual Meetings, 2010 – 2015 (*Note: OHBM Educational Courses are awarded based on competitive review.*)

Co-Organizer, *Genetics of the Connectome* Workshop, with David Glahn. 21st Annual Meeting, 2015. (*Note: OHBM Workshops are awarded based on highly competitive review.*)

Co-organizer, *How Not to Analyze Your Data: A Skeptical Introduction to Modeling Methods* Half-day Educational Course, with Victor Solo. 19th Annual Meeting, 2013.

Co-Organizer, *Big Data in Neuroimaging: Big Opportunities or Just a Big Hassle The Skeptical Neuroimagers View* Morning Workshop, with Martin Lindquist. 19th Annual Meeting, 2013.

Organizer, *Wheres Your Signal? Explicit Spatial Models to Improve Interpretability and Sensitivity of Neuroimaging Results* Morning Workshop, 18th Annual Meeting, 2012

Organizer, *How To Be a Skeptical Neuroimager: Functional Connectivity & Causal Modeling*. Morning Workshop, 17th Annual Meeting, 2011

Co-organizer, *Introduction to Imaging Genetics* 1/2 day Educational Course, with J-B Poline. 15th Scientific Meeting, 2009

Member, Advisory Board, Pittsburgh Brain Connectivity Competition. 15th Annual Meeting, 2009

Past Chair, Education Committee, 2007–2008

Chair, Education Committee, 2005–2007
Member, Advisory Board, Pittsburgh Brain Activity Interpretation Competition: Inferring Experience Based Cognition from fMRI. 12th Annual Meeting, 2006; 13th Annual Meeting, 2007.
Panelist, HBM Functional Imaging Analysis Contest, 11th Annual Meeting, 2005
Co-organizer, *Intersubject Heterogeneity in fMRI RFX Analyses* Morning Workshop, with S Smith. 11th Annual Meeting, 2005
Co-organizer, *Mixed Effects Models* Morning Workshop, with S Smith. 10th Annual Meeting, 2004
Co-organizer, *Inference in Neuroimaging: Thresholding Statistic Images* Morning Workshop, with S Smith. 9th Annual Meeting, 2003
Co-organizer, *Spatiotemporal Modeling in Functional Neuroimaging* Morning Workshop, with S Smith. 8th Annual Meeting, 2002
Member, 1998 –

Royal Statistical Society (RSS)

Co-Organizer, *Statistical Challenges in Brain Imaging* contributed session, with J Aston. RSS Conference 2009.
Fellow, 2008 –

Statisticians in the Pharmaceutical Industry (PSI)

Co-organizer, *Biomarkers in Early Development* 1 day meeting. Glaxo-SmithKline Clinical Imaging Centre. 18 November, 2008.
Member, Biomarkers Special Interest Group, 2008 – 2010.
Member, 2008 – 2010

Editorial Work

Editorial Boardmember, *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging*, 2015 –

Editor, Special Issue on “Sharing the wealth: Neuroimaging data repositories”, *Neuroimage*. With S Eickhoff, JD Van Horn, JA Turner. Volume 124(Pt.B), 2016. PMID 26574120.

Editorial Boardmember, *Scientific Data*, 2014 –

Editorial Boardmember, *PlosOne*, 2014 – 2016

Editorial Boardmember, *Brain Imaging and Behavior*, 2007 –

Editorial Boardmember, *Human Brain Mapping*, 2005 –

Editorial Boardmember, *NeuroImage*, 2005 –

Handling Editor, Modelling & Analysis, *NeuroImage*, 2009 – 2013

Editor, Special Issue on “Mathematics in Brain Imaging”, *Neuroimage*. With PM Thompson, MI Miller, RA Poldrack, JE Taylor, KJ Worsley, JT Ratnanather. Volume 45(1S), 2009. PMID 19027863.

Reviewing

External Review

Reviewer, Villum Foundation, Copenhagen, Denmark. 2014.

Member, International Advisory Board, Centre for Integrated Molecular Brain Imaging (CIMBI), Copenhagen, Denmark. 2009 review.

Site Visits

Member, International Advisory Board, Centre for Integrated Molecular Brain Imaging (CIMBI), Copenhagen, Denmark. 2009 review.

Journal Articles

Biological Psychiatry; Biometrics; Brain Research Protocols; Cerebral Cortex; Cognitive, Affective, & Behavioral Neuroscience; Human Brain Mapping; IEEE Transactions on Medical Imaging; IEEE Transactions on Nuclear Science; Journal of the American Statistical Association; Journal of Cerebral Blood Flow & Metabolism; Journal of Magnetic Resonance Imaging; Journal of Neuroscience Methods; Magnetic Resonance in Medicine; Medical Image Analysis; NeuroImage; Proceedings of the National Academies of Science; Schizophrenia Bulletin; Statistics in Medicine

Book Chapters

Bayesian Statistics 7; Case Studies in Bayesian Statistics

Book Proposals

Springer-Verlag

Research Grant Proposals

Wellcome Trust; member of the Cognitive Neuroscience and Mental Health Expert Review Group.

Engineering and Physical Sciences Research Council.

Medical Research Council.

L'Agence Nationale de la Recherche (National Research Agency of France).

University of Washington Alzheimer's Disease Research Center.

American Association for the Advancement of Science, Women's International Science Collaboration program.

Departmental & University Service

University of Warwick

Co-chair, Warwick Medical Imaging Network, a Network of Excellence of the Science and Technology for Health Global Research Priority, 2013 –.

University of Warwick, Warwick Manufacturing Group

Co-chair, fMRI Reading Group, 2009 – 2010

University of Warwick, Department of Statistics

Chair, IT Committee, 2014 –

Chair, Local Organizing Committee, UseR 2011 Conference, 2011

Member, Local Organizing Committee, UseR 2011 Conference, 2009 – 2010

University of Warwick, Department of Computer Science

Member, Program Committee, Medical Image Understanding and Analysis 2010 Conference, 2009 –

University of Michigan, Department of Biostatistics

Chair, Computer Committee, 2000 – 2006

Member, Admissions Committee, 2004 – 2006

Member, Curriculum Committee, 2002 – 2003

Chair, Seminar Committee, 2001 – 2002

Member, Seminar Committee, 2000 – 2001

University of Michigan, School of Public Health

Member, Computing & Network Committee, 2004 – 2006

University of Michigan, Office of the Vice President for Research

Member, Operations Committee, fMRI Lab, 2001 – 2006

Advising & Mentoring

Ph.D. Students Advised, University of Warwick

Zhangdaihong (Jessie) Liu. *Population Neuroimaging Genetics*. In Complexity Sciences DTC, co-advised with Jianfeng Feng, 2015 –.

Ruth Harbord. *Inferring population differences in dynamic connectivity in task-free fMRI*. In Molecular Organisation and Assembly in Cells DTC. 2014 –.

Bernd Taschler *Spatial modelling of Multiple Sclerosis lesions*. In Complexity Sciences DTC. 2014 – 2016 (expected).

Soroosh Afyouni. *Group inference on graph theoretic measures of brain connectivity*. 2013 – 2016 (expected).

Habib Ganjgahi. *Permutation and Random Field Methods for Neuroimaging Heritability Analysis*. 2013 – 2016 (expected).

Pantelis Samartsidis. *Statistical Modelling for Neuroimaging Meta-Analysis*. 2012 – 2016.

Dragana Pavlovic. *Optimal Fixed and Adaptive Designs for fMRI Clinical Trials*. MRC CASE Industrial PhD Studentship in Statistics sponsored by GlaxoSmithKline, joint with Prof. Ed Bullmore. 2011 – 2015.

Bryan Guillaume. *Improving Group Inference for fMRI Clinical Trials with Task or Task-Free Designs*. Marie Curie Initial Training Network studentship, through GlaxoSmithKline & Leige Université de Liège.) 2011 – 2015.

Tian Ge. *Kernel Machine Approaches to Detecting Genetic Associations in Imaging Data*. Computer Science student, co-advised with Jianfeng Feng. 2011 – 2014.

Lilia Carneiro-da-Costa. *Dynamic Bayesian Models for Resting State fMRI Data*, Co-advised with F Rigat. 2010 – 2015.

Xu Chen. *Spatially Regularization of Voxel-wise Heritability Estimates*. 2010 – 2015.

George Minas. *Adaptive Design for fMRI Clinical Trials*, Co-advised with F Rigat, JD Aston & N Stallard. 2009 – 2013.

M.Sc. Student Projects, University of Warwick

Sherman Ip (OxWasp, joint Oxford-Warwick student). *Inside-Out: Characterisation of Computed Tomography Noise in Projection and Image Space with Applications to 3D Printing*, 2015 – 2016.

Nathan Cunningham (OxWasp, joint Oxford-Warwick student). *Examining*

evidence for neurogenic atrial fibrillation using neuroimaging data, 2015 – 2016
Ashwath Padinjattayil Shaji, *Supply Change and Market Analysis of Medical Imaging Service in India*, 2014 – 2015.

Tom Watkins. *Advanced State Space Modelling of Driver Performance Data*, 2014 – 2015.

Renming Guo. *State Space Modelling of Driver Performance Data*, 2013 – 2014.

Jade Eaton. *Data Analysis of Driver Behaviour Using Machine Learning Techniques*, 2013 – 2014.

Suchin Jin. *Investigation of random variation in CT validation of Additive Layer Manufacturing*, 2013 – 2014.

Kevin Tang. *Interactive visualisation of high-dimensional brain imaging data and models*. 2013 – 2014.

Jack Stone. *Conjunction Inference for Neuroimaging*, 2012 – 2013.

Alexis Sofianos. *What kind of driver are you? Modelling of driver performance data*, 2012 – 2013.

Sabrina Khushi. *The Classification of Multiple Sclerosis From the Spatial Distribution of Lesions*, 2012 – 2013.

James Kwann. *Classification of Multiple Sclerosis Patients From Lesion Data*, 2012.

Thomas Honnor. *Building a modelling framework for cluster inference: Wheres the blob?*, 2012.

Shen Ting Ang. *False Discovery Rate Procedures for Neuroimaging*, 2011 – 2012.

Romain Hendrickx. *Optimizing the Robustness of fMRI Experimental Designs with a Genetic Algorithm*, visiting from University of Namur, Belgium, 2011.

Sam Cuthbertson. *The Erdős-Rényi Mixture Model for Graph Valued Data from Resting State fMRI Data*, 2010 – 2011.

Chipo Mashayamombe. *Analysis of Proteomic Data During and Outside of a Migraine Attack*, 2010.

Rachel Walton. *Using Clustering to Infer the Structure of Brain Anatomy Heritability*. 2009 – 2010.

B.S. Student Projects, University of Warwick

Peter Williams. *Browser-based Visualisation of NIDM Results Data Structures*. Summer Internship, 2016.

Alex Bowring. *Creating Massive Library of fMRI Analyses in NIDM Results*. Summer Internship, 2015.

Emma Thomas. *Exact Neuroimaging Inference with Nonparametric Permutation*. 3rd Year Engineering Project, 2010 – 2011.

Shen Ting Ang. *Improving the sensitivity of fMRI heritability estimates with spatial regularization*. Undergraduate Research Scholarship Scheme, awarded top-up with EPSRC 2010 Vacation Bursary Programme. 2009 – 2010.

Ph.D. Students Advised, Oxford University

Anderson Winkler. *Design and Analysis of Resting state pharmaco-fMRI clinical trials*. Marie Curie Initial Training Network studentship, through

GlaxoSmithKline & University of Maastricht, 2011 – 2016 (expected).

Ph.D. Students Advised, GlaxoSmithKline

David Cole, *Functional network analysis of human brain systems under pharmacological manipulation*. Co-advised with Christian Beckmann. Dept. of Clinical Neurosciences, Imperial College London. 2009 –

Reza Salimi, *Advancing Meta Analysis in fMRI*. Co-advised with Stephen Smith. FMRIB Centre, Oxford. August, 2007 – 2011.

Maria Vounou, *Joint Modelling of Imaging & Genetics Data*. Co-advised with B Whitcher (GSK) & G Montana (IC). Department of Mathematics (Statistics), Imperial College London. August, 2007 –

M.S. Student Projects, GlaxoSmithKline

Matt Silver. *Evaluating Nontationarty Cluster Size Inference for Imaging Genetics VBM Studies*. Co-advised with Giovanni Montana. Department of Mathematics (Statistics), Imperial College London. 2009 – 2010.

Biostatistics Ph.D. Students Advised, University of Michigan

Satoru Hayasaka, *Validating and Improving Cluster Size Inference in Brain Image Analysis*. January, 2001 – December, 2003

Wen-Lin Luo, *General Linear Model for fMRI Time Series Data: Model Formulation, Covariance Estimation, and Model Selection*. September, 2000 – August, 2004

Jeanette Mumford, Covariance modeling in group fMRI models. January, 2003 – June, 2006.

Hui Zhang, Random Field Theory for Cluster Mass Inference. May 2005 –
Lei Xu, Bayesian Spatial Modelling of Group fMRI Data. Co-advised with Timothy Johnson. May, 2005 – October, 2007.

Jian Kang, Bayesian Point Processing Neuroimaging Meta-Analysis Data. Co-advised with Timothy Johnson. September, 2007 – July, 2011.

Biostatistics M.S. Students supported, University of Michigan

Wei Xie, Evaluation of FDR methods under smoothness. September 2004 – May 2006

Hui Zhang, RA for Nichols RO1. Developing SPMd software to evaluate parametric assumptions in fMRI data. September, 2004 – April, 2005

Jun Ding, RA for Nichols RO1. Developing SnPM software for nonparametric permutation inference on neuroimaging data. January, 2004 – May, 2005.

Xiaoabi Huang, RA for Norman Foster, Neurology. Analysis of FDG-PET image data in Alzheimer's Disease patients & elderly normals. September, 2004 – August, 2007.

Kelly O'Brien, RA for Norman Foster, Neurology. Analysis of FDG-PET ROI data in Alzheimer's Disease patients & elderly normals. January – May, 2004

Erick Heyt-Ender, RA for Thomas Nichols. Accounting for missingness in fMRI slice-to-volume motion-corrected data. May, 2003 – April, 2004

Non-Biostatistics Ph.D. Committees, University of Michigan

Carol Anilowski, Business School, 2005 – 2006
Shao-Hsuan Ho, Psychiatry, 2005 – 2006
James Nelson, Psychology, 2004 – 2005
Anastasia Yendiki, Electrical Engineering, 2004 – 2005
Jennifer Britton, Psychiatry, 2002 – 2005
Alberto Vazquez, Biomedical Engineering, 2001 – 2005
Tor Wager, Psychology, 2002 – 2004
Sangtae Ahn, Electrical Engineering, 2003 – 2004
Brad Sutton, Biomedical Engineering, 2003 – 2004
Paul Hamilton, Psychology, 2003 – 2004
Scott Peltier, Applied Physics, 2001 – 2003
Marko Slyz, Electrical Engineering, 2001 – 2002
Charles Behensky, Psychology, 2001 – 2003

K30 Trainees, Statistical Advisor, University of Michigan

Aine Kelly, 2003 – 2004
Elaine Caioli, 2002 – 2003

External Examiner

Francisca Marie Tan, Ph.D., Electrical and Electronic Engineering, University of Nottingham. 2016.
Joke Durnez, Ph.D., School of Psychology, University of Ghent. 2015.
Christopher Minas, Ph.D., Mathematics/Statistics, Imperial College. 2014.
Gabiella Blokland, Ph.D., School of Psychology, University of Queensland. 2012.
Emma Sprooten, Ph.D., Division of Psychiatry, University of Edinburgh. 2012.
Sara Kherad-Pajouh, Ph.D., Mathematics/Psychology, University of Geneva. 2011.
David Glenn Lawyer, Ph.D., University of Oslo. 2008.
Moh'D Taleb Suleiman Al Odat, M.S., Statistics, McGill University. 2004.
Marnie Shaw, Ph.D., Medical Physics, University of Melbourne. 2002.

Methodological Publications *Publications with primarily statistical content that have received peer review. Student co-authors indicated in **bold** (91 in total.)*

TE Nichols, J Qi, and RL Leahy. Continuous time dynamic PET imaging using list mode data. In *Information Processing in Medical Imaging*, volume 1613 of *Lecture Notes in Computer Science*, pp 98–111, Berlin, 1999. Springer-Verlag. Proceedings of the 16th International Conference, IPMI'99.

KM Petersson, TE Nichols, J-B Poline, and AP Holmes. Statistical limitations in functional neuroimaging II. Signal detection and statistical inference. *Philosophical Transactions of the Royal Society: Biological Sciences*, 354:1261–1281, 1999. PMID 10466150.

KM Petersson, TE Nichols, J-B Poline, and AP Holmes. Statistical limitations in functional neuroimaging I. Non-inferential methods and statistical models. *Philosophical Transactions of the Royal Society: Biological Sciences*, 354:1239–1260, 1999. PMID 10466149.

E Asma, TE Nichols, J Qi and RM Leahy. 4D Image Reconstruction from List Mode Data. In *Proc. IEEE Nuclear Science Symposium and Medical Imaging Conference*, 2000.

TE Nichols and AP Holmes. Nonparametric Permutation Tests for Functional Neuroimaging: A Primer with Examples. *Human Brain Mapping*, 15:1-25, 2002. PMID 11747097.

CR Genovese, N Lazar and TE Nichols. Thresholding of Statistical Maps in Functional Neuroimaging Using the False Discovery Rate. *NeuroImage*, 15:870-878, 2002. PMID 11906227.

TE Nichols, J Qi, E Asma and RL Leahy. Spatiotemporal Reconstruction of List Mode PET Data. *IEEE Transactions on Medical Imaging*, 21:396-404, 2002. PMID 12022627.

A Ossadtchi, VM Brown, AH Khan, SR Cherry, T Nichols, RM Leahy, and DJ Smith. Statistical analysis of multiplex brain gene expression images. *Neurochemical Research*, 27:1113-1121, 2002. PMID 12462409.

E Asma, TE Nichols, RM Leahy. Temporal Resolution Properties of Dynamic PET Reconstructions. In *Proc. IEEE Nuclear Science Symposium and Medical Imaging Conference*, 2002.

TD Wager and TE Nichols. Optimization of Experimental Design in fMRI: A General Framework Using a Genetic Algorithm. *NeuroImage*, 18:293-309, 2003. PMID 12595184.

WL Luo and TE Nichols. Diagnosis & Exploration of Massively Univariate Neuroimaging Models. *NeuroImage*, 19:1014-1032, 2003. PMID 12880829.

D Pantazis, T Nichols, S Baillet, RM Leahy. Spatiotemporal Localization Of Significant Activation In MEG Using Permutation Tests. In *Information Processing in Medical Imaging*, volume 2732 of *Lecture Notes in Computer Science*, pp 512-523, Berlin, 2003. Proceedings of the 18th International Conference, IPMI 2003. PMID 15344484.

TE Nichols and **S Hayasaka**. Controlling the Familywise Error Rate in Functional Neuroimaging: A Comparative Review. *Statistical Methods in Medical Research*, 12:419-446, 2003. PMID 14599004.

S Hayasaka and TE Nichols. Validating cluster size inference: random field and permutation methods. *NeuroImage*, 20:2343-2356, 2003. PMID 14683734.

S Hayasaka, KL Phan, I Liberzon, KJ Worsley and TE Nichols. Non-Stationary Cluster Size Inference with Random Field and Permutation Methods *NeuroImage*, 22:676-687, 2004. PMID 15193596.

E Asma, TE Nichols, RM Leahy. Temporally Invariant Uniform Spatial Resolution in Dynamic PET. In *Proc. IEEE Nuclear Science Symposium and Medical Imaging Conference*, Portland, OR, 2003.

S Hayasaka and TE Nichols. Combining voxel intensity and cluster extent with permutation test framework. *NeuroImage*, 23:54-63, 2004. PMID 15325352.

D Pantazis, RM Leahy, TE Nichols, M Styner. Statistical surface-based morphometry using a non-parametric approach. In *Proc. IEEE International Symposium on Biomedical Imaging (ISBI'04)*, 1283–1286, 2004.

S Ahn, JA Fessler, TE Nichols, RA Koeppe. Covariance of kinetic parameter estimators based on time activity curve reconstructions: Preliminary study on 1D dynamic imaging. In *Proc. IEEE International Symposium on Biomedical Imaging (ISBI'04)*, 368–371, 2004.

D Pantazis, TE Nichols, S Baillet and RM Leahy. A comparison of random field theory and permutation methods for the statistical analysis of MEG data. *NeuroImage*, 25:3830-394, 2005. PMID 15784416.

TE Nichols, M Brett, J Andersson, T Wager and J-B Poline. Valid conjunction inference with the minimum statistic. *NeuroImage*, 25:653–660, 2005. PMID 15808966.

TE Lund, KH Madsen, K Sidaros, W-L Luo and TE Nichols. Non-white noise in fMRI: Does modelling have an impact? *NeuroImage*, 29:54–66, 2006. PMID 16099175.

J Mumford & TE Nichols. Modeling and inference of multisubject fMRI data - Using mixed-effects models for joint analysis. *IEEE Engineering in Medicine and Biology Magazine*, 25(2):42–51, 2006. PMID 16568936.

H Zhang, W-L Luo, TE Nichols. Diagnosis of single-subject and group fMRI data with SPMd. *Human Brain Mapping*, 27:442–451, 2006. PMID 16615119.

SM Smith, M Jenkinson, H Johansen-Berg, D Rueckert, TE Nichols, CE Mackay, KE Watkins, O Ciccarelli, MZ Cader, PM Matthews and TEJ Behrens. Tract-based spatial statistics: Voxelwise analysis of multi-subject diffusion data. *NeuroImage*, 31:1487–1505, 2006 PMID 16624579.

J Mumford, L Hernandez-Garcia, GR Lee, TE Nichols. Estimation Efficiency and Statistical Power in Arterial Spin Labeling fMRI. *NeuroImage*, 33:103–114, 2006. PMID 16860577.

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Chapters

MW Woolrich, CF Beckmann, TE Nichols, SM Smith. “Statistical Analysis of fMRI Data” in *fMRI Techniques and Protocols, Vol 41*, M Filippi, Ed. Springer-Verlag, New York, 2016.

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TE Nichols and AP Holmes. “Nonparametric Permutation Tests for Functional Neuroimaging,” in *Human Brain Function, 2nd Edition*, R Frackowiak, KJ Friston, C Frith and R Dolan, Eds. Academic Press, New York, 2003.

Software

Statistical Nonparametric Mapping, SnPM. A nonparametric toolbox for SPM. Last updated July 2016.

“randomise” tool in FSL. Nonparametric inference for the general linear model, latest FSL version, 2015.

False Discovery Rate for Statistical Parametric Mapping, FDR for SPM. Integration of FDR into SPM99 (subsequently adopted into core codebase) 2001.

Statistical Parametric Mapping Diagnosis, SPMd. A diagnostics toolbox for SPM99. Released, May 2002.

Invited Talks

Previous two years only.

TE Nichols. “Advances in Multimodal Neuroimaging Data Analysis & Data-Sharing.” *Lifespan Neurobiology Workshop*, University of Reading. 27 June, 2014.

TE Nichols. “Mass Univariate and Multivariate Approaches to Understanding Genetic Variation in the Brain.” *Summer School Brain Imaging Genetics*, Radboud University Nijmegen. 14 August, 2014.

TE Nichols. “Statistical issues with ‘Big Science’ Databases”. *Share and Flourish: New Standards for Data Sharing in the Neurosciences*, Lorentz Center, Leiden. 22 August, 2014.

TE Nichols. “Inference on SPMs: Random Field Theory & Alternatives.” In *SPM Course*, Wellcome Trust Centre for Neuroimaging, University College London. 16 October, 2014.

Given by Peter... wasn’t there TE Nichols. “Inference of statistical significance using Permutation Approach.” *SOLAR-Eclipse Workshop*, International Imaging Genetics Conference. 21 January, 2015.

TE Nichols. “Modelling Genetic Variation in the Brain with Multivariate and Mass Univariate Approaches.” *Neuroscience@Nottingham Symposium*, University of Nottingham. 14 January, 2015.

TE Nichols. “Advanced issues in fMRI statistics: Nonparametric Inference, Power & Meta-Analysis.” In *SPM Course*, Translational Neuromodeling Unit, University of Zurich & ETH Zurich. 5 February, 2015.

TE Nichols. “Spatial Bayesian Point Process Modelling for Neuroimaging Data.” *Clinical Imaging Research Centre*, National University of Singapore. 18 March, 2015.

TE Nichols. “Big Data Squared: Neuroimaging Genetics.” *Sustainable Futures: 21st Century Technologies for Health symposium*, Singapore. 19 March, 2015.

TE Nichols. “Pipelines for Analyzing Big Data.” *Sackler Institute for Developmental Psychobiology*, Weill Medical College of Cornell University. 31 March, 2015.

TE Nichols. “Two Wildly Different Approaches to Brain Connectivity in fMRI.” *Opening Workshop, Program on Challenges in Computational Neuroscience*, Statistical & Applied Mathematics Sciences Institute. 21 August, 2015.

TE Nichols. “Machine Learning Methods for Population Neuroimaging.” Integrated Academic Training Meeting, Warwick Medical School, University of Warwick. 12 November, 2015.

TE Nichols. “Maximizing Openness and Reproducibility in Neuroimaging.” Wellcome Trust Investigators meeting. 18 November, 2015.

TE Nichols. “Modelling Time-Varying effective Brain Connectivity using Multi-regression Dynamic Models.” 8th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics). 13 December, 2015.

TE Nichols. “The Past and Future of Random Field Theory for Neuroimaging Inference.” EPSRC CDT in High Performance Embedded and Distributed Systems, Imperial College. 27 January, 2016.

TE Nichols. “Empirical false positive rates of task fMRI Random Field Theory on resting state fMRI data.” *SPM Authors Homecoming*, Wellcome Trust Centre for Neuroimaging, University College London. 27 January, 2016.

TE Nichols. “Wither RFT: The past and future of Random Field Theory for neuroimaging inference.” Imaging Genetics Centre, University of Southern California. 22 January, 2016.

TE Nichols. “Advanced issues in fMRI statistics: Nonparametric Inference, Power & Meta-Analysis.” In *SPM Course*, Translational Neuromodeling Unit, University of Zurich & ETH Zurich. 18 February, 2016.

TE Nichols. “Analytical Challenges & Opportunities in Population Neuroimaging.” In *Structured Healthcare Data Mining for Neuroscience Patient Stratification and New Therapeutic Target Discovery*, Imperial College, 14 March, 2016,

TE Nichols & C Maumet. “Provenance in neuroimaging with NIDM-Results.” In *Alan Turing Institute Symposium on Reproducibility for Data Intensive Research*, Oxford University, 6 April 2016.

TE Nichols. “High- and low-tech solutions for multiple testing in large scale inference.” In *52nd Gregynog Statistical Conference*, 15 April 2016.

TE Nichols. “Meta-Analysis: Review and new developments in neuroimaging” In *52nd Gregynog Statistical Conference*, 16 April 2016.

TE Nichols “Power estimation for whole brain fMRI based on peaks.” In *Imaging Studies Section Meeting Sample size*, NIHR Statistics Group, Oxford, 20 April, 2016.

TE Nichols. “Mining neuroimage data in the Human Connectome Project.” In *Genomics of Brain Disorders*, Wellcome Genome Campus, 27 April, 2016.

TE Nichols. “Modelling Time-varying effective Brain Connectivity using Multi-regression Dynamic Models.” In *Novel Statistical Methods in Neuroscience* workshop, Institute for Mathematical Stochastics, Otto-von-Guericke University Magdeburg, Germany, 22-24 June, 2016.

TE Nichols. “Modelling Large- and Small-Scale Brain Networks.” In *Graph Limits and Statistics* workshop, Isaac Newton Institute for Mathematical Sciences, Cambridge, 11-15 July, 2016.

TE Nichols. “Wither RFT: The past and future of Random Field Theory for neuroimaging inference.” Harvard Medical School, Mass. General Hospital, Martinos Center Seminar, 29 August, 2016.

TE Nichols. “Large Scale Evaluation of Random Field Theory Inference in fMRI.” In *Contemporary Issues in Hypothesis Testing* workshop, Centre for Research in Statistical Methodology, University of Warwick, 15 September, 2016.