

## Professor Stephen Smith

Oxford Centre for Functional Magnetic Resonance Imaging of the Brain (FMRIB), which is part of:

**Wellcome Centre for Integrative Neuroimaging (WIN)**

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## Positions

- 2005 – University Professor of Biomedical Engineering, Department of Clinical Neurology, Oxford University  
Head of Analysis, FMRIB Centre
- 2004 – 2005 University Reader in Biomedical Image Analysis, Department of Clinical Neurology, Oxford University
- 2003 – 2015 Associate Director, FMRIB
- 2002 – 2007 EPSRC Advanced Research Fellow
- 2000 – 2004 University Research Lecturer, Faculty of Clinical Medicine, Oxford University
- 1997 – 2003 Head of Image Analysis, FMRIB, Oxford University
- 1989 – 1997 Grade 7 Scientist (final post), Computer Vision and Image Processing Group,  
Defence Research Agency, UK
  
- 2013 – 2014 Chair, Organisation for Human Brain Mapping
- 2013 – Senior Editor, NeuroImage
- 2011 – 2013 Handling Editor, NeuroImage
- 2008 – 2011 Handling Editor, Human Brain Mapping

## Education

- 1996 CEng MIEE
- 1989 – 1992 D.Phil. in Computer Vision, Dept. Engineering, Oxford University
- 1986 – 1989 B.A. (hons, first class) in Physics, Oxford University

## Brief Biography

Steve Smith is Professor of Biomedical Engineering and head of the Analysis Group at WIN/FMRIB. FMRIB's Analysis Group, which he started in 1997, now comprises about 30 research fellows, postdocs, students and staff, carrying out functional and structural brain image analysis and statistics research. The group has produced the brain image analysis software package FSL (FMRIB Software Library) which is widely used in many laboratories across the world.

Recent personal research has concentrated on resting state networks, showing that these correspond closely to explicit functional networks as seen in task fMRI (Smith, PNAS, 2009), showing new networks on the basis of distinct temporal dynamics (Smith, PNAS, 2012), and relating functional networks to behaviour and lifestyle (Smith, Nature Neuroscience, 2015). Currently, the FMRIB Analysis Group is playing a major role in the Human Connectome Project (Smith, TICS 2013; Smith, NeuroImage 2014), UK Biobank Imaging (Miller, Nature Neuroscience 2016), and the Developing Human Connectome Project.

## Publications

Scopus: h-index=107, 229 papers, average citations per paper ~380

## Journal Papers

- [1] S. Afyouni, S.M. Smith, and T.E. Nichols. Effective degrees of freedom of the Pearson's correlation coefficient under autocorrelation. *NeuroImage*, 199:609–625, 2019.
- [2] M. Bastiani, J.L.R. Andersson, L. Cordero-Grande, M. Murgasova, J. Hutter, A.N. Price, A. Makropoulos, S.P. Fitzgibbon, E. Hughes, D. Rueckert, S. Victor, M. Rutherford, A.D. Edwards, S.M. Smith, D. Tournier, J.V. Hajnal, S. Jbabdi, and S.N. Sotiropoulos. Automated processing pipeline for neonatal diffusion MRI in the developing Human Connectome Project. *NeuroImage*, 185:750–63, 2019.
- [3] L. Baxter, S. Fitzgibbon, F. Moultrie, S. Goksan, M. Jenkinson, S. Smith, J. Andersson, E. Duff, and R. Slater. Optimising neonatal fMRI data analysis: Design and validation of an extended dHCP preprocessing pipeline to characterise noxious-evoked brain activity in infants. *NeuroImage*, 186:286–300, 2019.
- [4] J. Bijsterbosch, C.F. Beckmann, M.W. Woolrich, S.M. Smith, and S.J. Harrison. The relationship between spatial configuration and functional connectivity of brain regions revisited. *eLife*, 2019.
- [5] S.Y. Bookheimer, D.H. Salat, M. Terpstra, B.M. Ances, D.M. Barch, R.L. Buckner, G.C. Burgess, S.W. Curtiss, M. Diaz-Santos, J.S. Elam, B. Fischl, D.N. Greve, H.A. Hagy, M.P. Harms, O.M. Hatch, T. Hedden, C. Hodge, K.C. Japardi, T.P. Kuhn, T.K. Ly, S.M. Smith, L.H. Somerville, K. Ugurbil, A. van der Kouwe, D. Van Essen, R.P. Woods, and E. Yacoub. The lifespan human connectome project in aging: An overview. *NeuroImage*, 185:335–48, 2019.
- [6] D. Bzdok, T.E. Nichols, and S.M. Smith. Towards algorithmic analytics for large-scale datasets. *Nature Machine Intelligence*, 1:296–306, 2019.
- [7] M.F. Glasser, T.S. Coalson, J.D. Bijsterbosch, S.J. Harrison, Harms M.P., A. Anticevic, D.C. Van Essen, and S.M. Smith. Classification of temporal ICA components for separating global noise from fMRI data: Reply to Power. *NeuroImage*, 197:435–8, 2019.
- [8] M. Hernandez-Fernandez, I. Reguly, S. Jbabdi, M. Giles, S. Smith, and S.N. Sotiropoulos. Using GPUs to accelerate computational diffusion MRI: From microstructure estimation to tractography and connectomes. *NeuroImage*, 188:598–615, 2019.
- [9] J. Mollink, S.M. Smith, L.T. Elliott, M. Kleinnijenhuis, M. Hiemstra, F. Alfaro-Almagro, J. Marchini, A.-M. van Cappellen van Walsum, S. Jbabdi, and K.L. Miller. The spatial correspondence and genetic influence of interhemispheric connectivity with white matter microstructure. *Nature Neuroscience*, 22:809–19, 2019.
- [10] L. Nobis, S.G. Manohar, S.M. Smith, F. Alfaro-Almagro, M. Jenkinson, C.E. Mackay, and M. Husain. Hippocampal volume across age: Nomograms derived from over 19,700 people in UK Biobank. *NeuroImage: Clinical*, 23:101904, 2019.
- [11] R. Sala-Llonch, S.M. Smith, M. Woolrich, and E.P. Duff. Spatial parcellations, spectral filtering, and connectivity measures in fMRI: Optimizing for discrimination. *Human Brain Mapping*, 40(2):407–19, 2019.
- [12] S.M. Smith, D. Vidaurre, F. Alfaro-Almagro, T.E. Nichols, and K.L. Miller. Estimation of brain age delta from brain imaging. *NeuroImage*, 200:528–539, 2019.
- [13] S.M. Smith, E. Duff, A. Groves, T.E. Nichols, S. Jbabdi, L.T. Westlye, C.K. Tamnes, A. Engvig, K.B. Walhovd, A.M. Fjell, H. Johansen-Berg, and G. Douaud. Structural variability in the human brain reflects fine-grained functional architecture at the population level. *J Neuroscience*, 39(31):6136–49, 2019.
- [14] T. Spisák, Z. Spisák, N. Zunhammer, U. Bingel, S. Smith, T. Nichols, and T. Kincses. Probabilistic TFCE: A generalized combination of cluster size and voxel intensity to increase statistical power. *NeuroImage*, 185:12–26, 2019.

- [15] A. Wiberg, M. Ng, Y. Al Omran, F. Alfaro-Almagro, P. McCarthy, J. Marchini, D.L. Bennett, S. Smith, G. Douaud, and D. Furniss. Handedness, language areas and neuropsychiatric diseases: insights from brain imaging and genetics. *Brain*, 142(10):2938–47, 2019.
- [16] K. Zarnani, T.E. Nichols, F. Alfaro-Almagro, B. Fagerlund, M. Lauritzen, E. Rostrup, and S.M. Smith. Discovering markers of healthy aging: a prospective study in a Danish male birth cohort. *Aging*, 11(16):5943–74, 2019.
- [17] L.T. Elliott, K. Sharp, F. Alfaro-Almagro, S. Shi, K.L. Miller, G. Douaud, J. Marchini, and S.M. Smith. Genome-wide association studies of brain imaging phenotypes in UK Biobank. *Nature*, 562:210–216, 2018.
- [18] S.M. Smith and T.E. Nichols. Statistical challenges in “big data” human neuroimaging. *Neuron*, 97:263–268, 2018.
- [19] F. Alfaro-Almagro, M. Jenkinson, N.K. Bangerter, J.L.R. Andersson, L. Griffanti, G. Douaud, S.N. Sotiropoulos, S. Jbabdi, M. Hernandez-Fernandez, E. Valee, D. Vidaurre, M. Webster, P. McCarthy, C. Rorden, A. Daducci, D.C. Alexander, H. Zhang, I. Dragonu, P.M. Matthews, K.L. Miller, and S.M. Smith. Image processing and quality control for the first 10,000 brain imaging datasets from UK Biobank. *NeuroImage*, 166:400–424, 2018.
- [20] J. Bijsterbosch, M.W. Woolrich, M.F. Glasser, E.C. Robinson, C.F. Beckmann, D.C. Van Essen, S.J. Harrison, and S.M. Smith. The relationship between spatial configuration and functional connectivity of brain regions. *eLife*, 2018.
- [21] J.D. Bijsterbosch, T.L. Ansari, S. Smith, O. Gauld, O. Zika, S. Boessenkool, M. Browning, A. Reinecke, and S.J. Bishop. Stratification of MDD and GAD patients by resting state brain connectivity predicts cognitive bias. *NeuroImage Clinical*, 19:425–433, 2018.
- [22] J. Bozek, A. Makropoulos, A. Schuh, S. Fitzgibbon, R. Wright, M.F. Glasser, T.S. Coalson, J. O’Muircheartaigh, J. Hutter, A.N. Price, L. Cordero-Grande, R.P.A.G. Teixeira, E. Hughes, N. Tusor, K.P. Baruteau, M.A. Rutherford, D.A. Edwards, J.V. Hajnal, S.M. Smith, D. Rueckert, M. Jenkinson, and E.C. Robinson. Construction of a neonatal cortical surface atlas using Multimodal Surface Matching in the Developing Human Connectome Project. *NeuroImage*, 179:11–29, 2018.
- [23] G.L. Colclough, M.W. Woolrich, S.J. Harrison, P.A. Rojas Lopez, P.A. Valdes-Sosa, and S.M. Smith. Multi-subject hierarchical inverse covariance modelling improves estimation of functional brain networks. *NeuroImage*, 178:370–384, 2018.
- [24] E.P. Duff, T. Makin, M. Cottaar, S.M. Smith, and M.W. Woolrich. Disambiguating brain functional connectivity. *NeuroImage*, 173:540–550, 2018.
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- [37] L.D. Nickerson, S.M. Smith, D. Önger, and C.F. Beckmann. Using dual regression to investigate network shape and amplitude in functional connectivity analyses. *Frontiers in Neuroscience*, 2017.
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- [39] D. Vidaurre, S.M. Smith, and M.W. Woolrich. Brain network dynamics are hierarchically organized in time. *PNAS*, 114(28):12827–12832, 2017.
- [40] M. Chiew, N.N. Graedel, J.A. McNab, S.M. Smith, and K.L. Miller. Accelerating functional MRI using fixed-rank approximations and radial-cartesian sampling. *Magnetic Resonance in Medicine*, 76(6):1825–1836, 2016.
- [41] M.F. Glasser, T.S. Coalson, E.C. Robinson, C.D. Hacker, J. Harwell, E. Yacoub, K. Ugurbil, J. Andersson, C.F. Beckmann, M. Jenkinson, S.M. Smith, and D.C. Van Essen. A multi-modal parcellation of human cerebral cortex. *Nature*, 536:171–178, 2016.
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