

Research Experience

2008-now

Imperial College London

London, UK

Post Doctoral Research Fellow (Supported by an MRC Fellowship Award)

Computing Department & Image Sciences Department, Imperial College London. They have been rated 5* at the last Research Quality Assessment and Computing has been placed among the top ten departments worldwide.

- Developing an inference framework to predict functional brain connectivity from structural brain connectivity based on multivariate canonical correlation. (*ISBI 10*)
- Extending this framework to incorporate both direct and indirect connectivity. (*ISBI 11*)
- Extending this work to a probabilistic framework that incorporates a generative model of functional connectivity based on Gaussian graphical models. In this work, we use the support to enhance the accuracy of the sample covariance matrix by imposing conditional independence when there are no structural connections. (*IPMI 11, NIPS-MLIN 11*)
- Exploiting hierarchy in structural brain networks. (Collaboration with CMIC, UCL)(*ISBI 11*)
- Establishing collaboration with internationally recognised groups for their work on fMRI and statistics (Parietal Project Team, INRIA). (*IPMI 11, NIPS-MLIN 11*)

2006-2008

Birkbeck College

London, UK

Post Doctoral Research Fellow (Supported by James S. McDonnell Foundation)

Centre of Brain and Cognitive Development (CBCD) has been rated 5* at the last Research Quality Assessment and it has been awarded the Queen's Anniversary Prize for Higher Education for 'Neuropsychological work with the very young'.

- Developed an interface between the tobii eyetracker and matlab for contingent eyetracking experiments. This toolbox is used from top research labs worldwide. (*For more details visit: <http://www.cbcd.bbk.ac.uk/people/affiliated/fani/talk2tobii>*)
- Exploit contingent eye-tracking to understand the development of communication skills in infants. (*Journal of Developmental Psychology 11*)
- Near Infrared Spectroscopy to detect activation during communicative tasks. (*Proceeding of the Royal Society, London B, 08*)

2005-2006

Imperial College London

London, UK

Research Assistant, Pervasive Computing, Department of Computing

- Investigated the use of Independent Component Analysis for source separation in Body Sensor Networks to extract intrinsic physiological and contextual information. (*BSN 06*)
- Developed algorithms for temporal normalisation and averaging of HbO₂ detected by NIRS.
- Utilised optical tracking technology to develop techniques that compare novice with expert surgeons based on eye tracking. (*HBM 06, MIAR 06*)

2000-2001

Informatics and Telematics Institute

Thessaloniki, Greece

Software Engineer

- Worked at the Informatics and Telematics Institute (ITI) that has been evaluated of 9.65/10 for excellence in research from independent experts in Information and Telecommunication Technology from European countries other than Greece. (For more details visit: www.iti.gr)
- Integrate deformable 3D faces with a Text-to-Speech (TTS) system. (*EURASIP Journal 02*)

Awards

2008-2011

MRC Special Fellowship in Biomedical Informatics

London, UK

MRC awards for researchers of exceptional ability are highly competitive with an average one award for every ten candidates and a limited number of allowed candidates for each department.

- The proposed project aims to investigate links between structural connectivity as it is measured with Diffusion Weighted Images (DWI) and functional brain connectivity captured with resting-state (rs)-fMRI. (Mentors: Prof. D. Rueckert and Prof. D. Edwards)

Other Activities

- Reviewer for IEEE TMI, MICCAI, ISBI.

Publications

Refereed Articles in Journals

1. *F. Deligianni, A. Senju, G. Gergely, and G. Csibra, Automated Gaze-Contingent Objects Elicit Orientation Following in 8-months-old infants, *Developmental Psychology*, in press, 2011.
2. T. Grossmann, M. Johnson, S. Lloyd-Fox, A. Blasi, F. Deligianni, C. Elwell, and G. Csibra, Early Cortical Specialisation for face-to-face Communication in Human Infants, *Proceedings of the Royal Society, London B*, 275, 2803-2811, 2008.
3. *F. Deligianni, A. Chung, and G. Z. Yang, Non-Rigid 2D/3D Registration for Patient Specific Bronchoscopy Simulation with Statistical Shape Modelling, *IEEE Transactions on Medical Imaging*, 25(11): 1462-1471, 2006.
4. *F. Deligianni, A. Chung, and G. Z. Yang, Patient-Specific Bronchoscope Simulation with pq-Space-Based 2D/3D Registration, *Computer Aided Surgery*, 9(5): 215-226, 2004.
5. A. J. Chung, F. Deligianni, P. Shah, A. Wells, and G. Z. Yang, Patient Specific Bronchoscopy Visualisation through BRDF Estimation and Disocclusion Correction, *IEEE Transactions of Medical Imaging*, 25(4): 503- 513, 2006.
6. A. J. Chung, F. Deligianni, X. P. Hu, and G. Z. Yang, Extraction of Visual Features with Eye Tracking for Saliency Driven 2D/3D Registration, *Image and Vision Computing*, 23: 999-1008, 2005.
7. N. Grammalidis, N. Sarris, F. Deligianni, and M. G. Strintzis, Three-Dimensional Facial Adaptation for Mpeg-4 Talking Heads, *EURASIP Journal on Applied Signal Processing*, 10: 1005-1020, 2002.

Refereed Articles in Conferences

8. *F. Deligianni, E. C. Robinson, D. Sharp, A. D. Edwards, D. Rueckert, and D. C. Alexander, Hierarchy in Structural Brain Networks, Medical Image Understanding and Analysis (MIUA11), London, UK, 2011.
9. *F. Deligianni, G. Varoquaux, B. Thirion, E. C. Robinson, D. Sharp, A. D. Edwards, and D. Rueckert, A Probabilistic Framework to Infer Brain Functional Connectivity from Anatomical Connections, Information Processing in Medical Imaging (IPMI11), Monastery Irsee, Germany, 296-307, 2011.
10. *F. Deligianni, E. C. Robinson, D. Sharp, A. D. Edwards, D. Rueckert, and D. C. Alexander, Exploiting Hierarchy in Structural Brain Networks, IEEE Symposium on Biomedical Imaging (ISBI11), Chicago, USA, 871-874, 2011.
11. *F. Deligianni, E. C. Robinson, C. F. Beckmann, D. Sharp, A. D. Edwards, and D. Rueckert, Inference of Functional Connectivity from Direct and Indirect Structural Brain Connections, IEEE Symposium on Biomedical Imaging (ISBI11), Chicago, USA, 849-852, 2011.
12. *F. Deligianni, E. C. Robinson, C. F. Beckmann, D. Sharp, A. D. Edwards, and D. Rueckert, Inference of Functional Connectivity from Structural Brain Connectivity, IEEE Symposium on Biomedical Imaging (ISBI10), Rotterdam, The Netherlands, 1113-1116, 2010.
13. *F. Deligianni, A. Chung, and G.-Z. Yang, Non-Rigid 2D-3D Registration with Catheter Tip EM Tracking for Patient Specific Bronchoscope Simulation, Medical Image Computing and Computer Assisted Intervention (MICCAI06), Copenhagen, Denmark, 2006.
14. *F. Deligianni, A. Chung, and G. Z. Yang, Predictive Camera Tracking for Bronchoscope Simulation with Condensation, International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI05), Palm Springs, California, USA, 910-916, 2005.
15. *F. Deligianni, A. Chung, and G. Z. Yang, Decoupling of Respiratory Motion with Wavelet and Principal Component Analysis, Medical Image Understanding and Analysis (MIUA04), London, UK, 13-16, 2004.
16. *F. Deligianni, A. Chung, and G. Z. Yang, 2D/3D Registration Using Shape from Shading Information in Application to Endoscope, Medical Image Understanding and Analysis (MIUA03), Sheffield, UK, 33-36, 2003.
17. *F. Deligianni, A. Chung, and G. Z. Yang, pq-Space Based 2D/3D Registration for Endoscope Tracking,

- Medical Image Computing and Computer Assisted Intervention (MICCAI03), Montréal, Québec, Canada, 311-318, 2003.
18. B. Lo, F. Deligianni, and G.-Z. Yang, Source Recovery for Body Sensor Network, International Workshop on Wearable and Implantable Body Sensor Networks (BSN), MIT-medial lab, Boston, USA, 199-202, 2006.
 19. D. R. Leff, H. K. Peck, R. Aggarwal, F. Deligiani, C. Elwell, D. Delpy, G. Z. Yang, and A. Darzi, Optical Mapping of the Frontal Cortex During Learning of a Surgical Knot-Tying Task, a Pilot Study, Human Brain Mapping, Florence, Italy, 2006.
 20. D. Leff, P. H. Koh, R. Aggarwal, J. Leong, F. Deligiani, C. Elwell, D. T. Delpy, A. Darzi, and G.-Z. Yang, Optical Mapping of the Frontal Cortex During a Surgical Knot-Tying Task, a Feasibility Study, Medical Imaging and Augmented Reality (MIAR), Shanghai, PR China, 2006.
 21. D. Stoyanov, G. P. Mylonas, F. Deligianni, A. Darzi, and G. Z. Yang, Soft-Tissue Motion Tracking and Structure Estimation for Robotic Assisted Mis Procedures, 8th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI05), Palm Springs, California, USA, 139-146, 2005.
 22. G. P. Mylonas, D. Stoyanov, F. Deligianni, A. Darzi, and G. Z. Yang, Gaze-Contingent Soft Tissue Deformation Tracking for Minimally Invasive Robotic Surgery, 8th International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI05), Palm Springs, California, USA, 843-850, 2005.
 23. A. J. Chung, F. Deligianni, P. Shah, A. Wells, and G. Z. Yang, Vis-a-Ve: Visual Augmentation for Virtual Environments in Surgical Training, Eurographics / IEEE VGTC Symposium on Visualization, Leeds, UK, 101-108, 2005.
 24. A. J. Chung, P. J. Edwards, F. Deligianni, and G. Z. Yang, Freehand Cocalibration of an Optical and Electromagnetic Tracker for Navigated Bronchoscopy, The Second International Workshop on Medical Imaging and Augmented Reality (MIAR 2004), Beijing, China, 2004.
 25. A. J. Chung, F. Deligianni, P. Shah, A. Wells, and G. Z. Yang, Enhancement of Visual Realism with BRDF for Patient Specific Bronchoscopy Simulation, MICCAI, Rennes, France, 2004.
 26. A. J. Chung, F. Deligianni, X.-P. Hu, and G. Z. Yang, Visual Feature Extraction Via Eye Tracking for Saliency Driven 2D/3D Registration, Eye Tracking Research and Applications (ETRA04), San Antonio, Texas, USA, 2004.
 27. J. X. Gao, S. Masood, F. Deligianni, and G. Z. Yang, Reconstruction of 3D Deformation from 2D MR Velocity Mapping with Incompressibility Constraints, International IEEE EMBS Special Topic Conference on Information Technology Applications in Biomedicine, 134-137, 2003.

Refereed Abstracts in Conferences

28. *F. Deligianni, G. Varoquaux, B. Thirion, E. Robinson, D.J. Sharp, A. D. Edwards, and D. Rueckert, Relating brain functional connectivity to anatomical connections: Model Selection, workshop on Machine Learning and Interpretation in Neuroimaging, Neural Information Processing (NIPS), Granada, Spain, 2011.
29. A. Senju, F. Deligianni, G. Gergely, and G. Csibra, Gaze Following Depends on a Preceding Ostensive Signal in Early Infancy, Workshop on Pragmatic Development, Lyon, France, 2009.
30. A. Chung, F. Deligianni, M. Elhelw, P. Shah, A. Wells, and G. Z. Yang, Assessing Realism of Virtual Bronchoscopy Images Via Specialist Survey and Eye-Tracking, Medical Image Perception Conference XI (MIPS XI), Abstract, Windermere, UK, 2005.
31. A. J. Chung, F. Deligianni, P. Shah, A. Wells, and G. Z. Yang, Video Driven Finite Element Deformation Models for Surgical Simulation, International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI05), Communication, Palm Springs, California, USA, 2005.