JINMING DUAN

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PROFILE

I am now a research associate within Department of Computing & Department of Imaging Science of the Institute of Clinical Science at Imperial College London. I am working under Dr Declan O'Regan and Prof Daniel Rueckert. I finished my PhD within the School of Computer Science at the University of Nottingham. My research interests involve machine learning such as deep neural networks, variational methods, partial differential equations, numerical optimisation, finite difference/element methods, with applications to image processing, computer vision and medical imaging analysis.

Education

Nanjing University of Information Science and Technology	NANJING, CHINA
BSc in Information Management & Information Systems	*Sep 2007 – Jun 2011*

Qingdao University	QINGDAO, CHINA
MSc in Computer Science	*Sep 2011 – Jun 2014*

Projects Involved:

- Global optimisation models for multiphase image segmentation and their fast algorithms, funded by National Natural Science Foundation of China, project number: 61170106
- Clinical decision system development for paediatric liver tumour surgery, funded by National Twelfth Five-Year Development Plan of Science and Technology, project number: 2013BAI01B03

Master Thesis:

- A study on generalised variational level set methods and their fast projection optimisation algorithms*
  Winner of Best Thesis Prize for School of Computer Science (1 people in the School)
  Winner of Best Thesis Prize for Shandong Province, China (10 people across the University)

University of Nottingham	NOTTINGHAM, UK
PhD in Computer Science	*Oct 2014 – Sep 2017*

Projects Involved:

- Regularisation methods for the nonlinear inverse problem for diffuse optical tomography imaging reconstruction
- Automated optical coherence tomography image segmentation for biomarkers identification for retinal and optical nerve disease diagnosis
- Microglia and astrocytes analysis: development of methods for cell segmentation, microglia activation state classification on histology data
- Automated malaria parasites detection and classification from Giemsa-stained blood smear images.

Postgraduate Teaching Assistant:

- Computer Graphics
- Graphical User Interfaces

SKILLS

- Excellent ability of mathematical modelling and real-world problems troubleshooting
- Excellent with MATLAB (hybridized with C/C++), Python, LaTeX
- Clear, logical and accurate writing skills
- High-level computing experience: Microsoft Office Suite, GIMP, Paraview, VTK toolkit, 3D Slicer, Tensorflow (GPU), Anaconda, Docker, IRTK, MRTK, CMake, various python libraries such as simpleITK, scikit-learn, OpenCV, etc.

SELECT PAPERS · Google Scholar · ResearchGate

- G Bello, T Dawes, J Duan, et al. **Deep learning cardiac motion analysis for human survival prediction**. *Nature Machine Intelligence, 1 (2) 95 2019.*
- J Duan, G Bello, J Schlemper, et al. **Automatic 3D bi-ventricular segmentation of cardiac images by a shape-constrained multi-task deep learning approach**. *IEEE Transactions on Medical Imaging, 2019.*
- J Spencer, K Chen, J Duan. **Parameter-free selective segmentation with convex variational methods**. *IEEE Transactions on Image Processing, 28 (5), 2163-2172, 2019.*
- J Schlemper, O Oktay, W Bai, J Duan, et al. **Cardiac MR segmentation from undersampled k-space using deep latent representation learning**. *MICCAI, 2018.*
- J Duan, J Schlemper, W Bai, et al. **Deep nested level sets: Fully automated segmentation of cardiac MR images in patients with pulmonary hypertension**. *MICCAI, 2018.*
- G Bello, T Dawes, J Duan, et al. **Using Three-Dimensional Cardiac Motion for Predicting Mortality in Pulmonary Hypertension: A Deep Learning Approach**. *MIDL, 2018*
- • J Duan, J Schlemper, W Bai, et al. **Combining Deep Learning and Shape Priors for Bi-Ventricular Segmentation of Volumetric Cardiac Magnetic Resonance Images**. *MICCAI ShapeMI, 2018.*
- J Duan, W Xie, et al. **OCT segmentation: Integrating open parametric contour model of the retinal layers and shape constraint to the Mumford-Shah functional**. *MICCAI ShapeMI, 2018.*
- RW Liu, W Yin, L Shi, J Duan, SCH Yu, D Wan. **Undersampled CS image reconstruction using non-convex nonsmooth mixed constraints**. *Multimedia Tools and Applications, 1-34, 2018*
- L Tan, Z Pan, W Liu, J Duan, et al. **Image segmentation with depth information via simplified variational level set formulation**. *Journal of Mathematical Imaging and Vision, 60 (1), 1-17, 2018.*
- D Yang, G Subramanian, J Duan, S Gao, L Bai, R Chandramohanadas, and Ye Ai. **A portable image-based cytometer for rapid Malaria detection and quantification**. *PloS ONE, 12 (6): e0179161, 2017.*
- J Duan, C Tench, I Gottlob, F Proudlock and L Bai. **Automated segmentation of retinal layers from optical coherent tomography images using geodesic distance**. *Pattern Recognition, 72 (2017): 158-175.*
- J Duan, W Ward, L Sibbett, Z Pan and L Bai. **Introducing diffusion tensor to high order variational model for image reconstruction**. *Digital Signal Processing, 69 (2017): 323-336, 2017.*
- Y Ding, M Pardon, A Agostini, H Faas, J Duan, W Ward, F Easton, D Auer and L Bai. **Novel methods for microglia segmentation, feature extraction and classification**. *IEEE/ACM Transactions on Computational Biology and Bioinformatics, 14 (6), 1366-1377, 2017.*
- J Duan, Z Qiu, W Lu, G Wang, Z Pan and L Bai. **An edge-weighted second order variational model for image decomposition**. *Digital Signal Processing, 49 (2016): 162-181, 2016.*
- J Duan, W Lu, Z Pan and L Bai. **New second order Mumford-Shah model based on Γ-convergence approximation for image processing**. *Infrared Physics & Technology, 76 (2016): 641-647, 2016.*
- J Duan, W Lu, C Tench, I Gottlob, F Proudlock and L Bai. **Denoising optical coherence tomography using second order total generalised variation decomposition**. *Biomedical Signal Processing and Control, 24 (2016): 120-127, 2016.*
- J Duan, B Haines, W Ward and L Bai. **Surface reconstruction from point clouds using a novel variational model**. *Research and Development in Intelligent Systems XXXII 135-146, 2015.*
- Y Ding, W Ward, J Duan, D Auer, P Gowland and L Bai. **Retinal vasculature classification using novel multifractal features**. *Physics in Medicine and Biology, 60 (21): 8365-8379, 2015.*
- J Duan, C Tench, I Gottlob, F Proudlock and L Bai. **New variational image decomposition model for simultaneously denoising and segmenting optical coherence tomography images**. *Physics in Medicine and Biology, 60 (22): 8901-8922, 2015.*
- J Duan, Z Pan, B Zhang, W Liu and X Tai. **Fast algorithm for color texture image inpainting using the non-local CTV model**. *Journal of Global Optimization, 62 (4): 853-876, 2015.*
- J Duan, Z Pan, X Yin, W Wei and G Wang. **Some fast projection methods based on Chan-Vese model for image segmentation**. *EURASIP Journal on Image and Video Processing, 2014 (1): 1-16, 2014.*

PRESENTATIONS

- **Exhibition at Science Museum London Lates**
Introducing public about how AI technology is transforming the landscape of healthcare
- **AI shaping tomorrow's world at Imperial Fringe (2017/18)**
Introducing public about how AI can help doctors better treat patients with cardiovascular diseases
- **From images to outcomes: Applying machine learning to heart failure**
Invited talk for Research at the Interface of Cardiology and Bioengineering at Imperial College London, UK, 2018
- **Deep supervised level set method: an approach to fully automated segmentation of cardiac MR**

images in patients with pulmonary hypertension
Invited talk on Centre for Mathematical Sciences at University of Cambridge, UK, 2018 (Feb)
● **Variational methods in image processing**
Invited report in Centre for Mathematical Imaging Techniques (CMIT), University of Liverpool, UK, 2017
● **Surface reconstruction from point clouds**
Invited report in Centre for Mathematical Imaging Techniques (CMIT), University of Liverpool, UK, 2016
AI-2015 Thirty-fifth SGAI International Conference on Artificial Intelligence, University of Cambridge, UK, 2015
● **Multiphase image segmentation using generalised variational level set method**
Invited report in the Northeast Forest University and the Shenzhen University, China, 2016
● **Optical coherence tomography image segmentation (Oral)**
IEEE International Conference on Image Processing (ICIP), Québec, Canada, 2015
● **Second order Mumford-Shah model for image denoising (Poster)**
IEEE International Conference on Image Processing (ICIP), Québec, Canada, 2015
● **Three-dimensional computerised tomography image reconstruction for tumor surgery in liver**
LINK'15 the 1st Student-Led Interdisciplinary Research Conference, University of Nottingham, UK, 2015
● **High order variational model for image decomposition using the split Bregman algorithm**
International Conference on Intelligence Science and Big Data Engineering (IScIDE), Suzhou, China, 2015

REVIEWER FOR

● IEEE Transaction on Image Processing ● IEEE Transaction on Medical Imaging ● Biomedical Optics Express ● PLOS ONE ● Biomedical Signal Processing and Control ● Digital Signal Processing ● Mathematical Geosciences ● Infrared Physics and Technology ● IET Image Processing ● IET Computer Vision ● Information Processing Letters ● Signal, Image and Video Processing ● Information Science ● Sensors ● Entropy ● Journal of Electronic Imaging ● Mathematics ● Water ● Pattern Recognition ● BMC Bioinformatics ● IEEE Journal of Biomedical and Health Informatics ● Swarm and Evolutionary Computation ● IEEE Access ● Applied Sciences ● Signal Processing: Image Communication ● Data ● Magnetic Resonance in Medicine ● Biocybernetics and Biomedical Engineering

OTHER AWARDS

● Chinese Government Award for Outstanding Self-funded Students, 2016 (500 people across the globe)
● PhD studentship from the School of Computer Science, University of Nottingham, UK, 2014 (10 people)
● Second place in Shandong Province Postgraduate Scientific and Technological Progress Award, 2013
● First place in Qingdao University Postgraduate Scientific and Technological Progress Award, 2013
● Grant from Qingdao University for my master thesis, 2013 (1 people in the School)