

# JINMING DUAN 15/01/1989

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## WORK EXPERIENCE

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University of Birmingham  
**Lecturer in Computer Science**

BIRMINGHAM, UK  
*Mar 2019 – Now*

Teaching Involved:

- Visualisation
  - Neural Computation and Neural Computation (Extended)
  - Data Science Group Project
  - Current Topics in Data Science
  - MSc & BSc Project Supervision
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Imperial College London  
**Research Associate**

LONDON, UK  
*Sep 2017 – Mar 2019*

Projects Involved:

- SmartHeart, funded by EPSRC under EP/P001009/1
- Using machine learning to predict clinical outcomes in heart failure, funded by British Heart Foundation under NH/17/1/32725

Line Managers:

- [Professor Daniel Rueckert](#)
  - [Professor Declan O'Regan](#)
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## EDUCATION

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University of Nottingham  
**PhD in Computer Science**

NOTTINGHAM, UK  
*Oct 2014 – Sep 2017*

Projects Involved:

- BitMap (brain injury and trauma monitoring using advanced photonics), funded by European Union's Horizon 2020 under 675332
- A new approach to optical coherence tomography image analysis using machine learning, funded by BBSRC under BB/P027105/1

PhD Thesis:

- [Variational and PDE-based methods for image processing](#)

Supervisor:

- [Dr Bai Li](#)

Teaching Assistant:

- Computer Graphics
  - Graphical User Interfaces
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[Qingdao University](#)  
**MSc in Computer Science**

QINGDAO, CHINA  
*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 under project number 61170106
- Clinical decision system development for paediatric liver tumour surgery, funded by National Twelfth Five-Year Development Plan of Science and Technology under project number 2013BAI01B03

Master Thesis:

- A study on generalised variational level set methods and their fast projection 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)

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[Nanjing University of Information Science and Technology](#)  
**BSc in Information Management & Information Systems**

NANJING, CHINA  
*Sep 2007 – Jun 2011*

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## GRANTS

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- Paul and Yuanbi Ramsay Research Fund (£7,000)
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## SELECTED PUBLICATIONS · [Google Scholar](#) · [ResearchGate](#)

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### Journal Papers:

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- [1] C Biffi, J Cerrolaza, G Tarroni, W Bai, O Oktay, K Kamnitsas, G Doumou, **J Duan**, et al. Explainable shape analysis through deep hierarchical generative models: Application to cardiac remodeling, **IEEE Transactions on Medical Imaging**, 39(6), 2088-2099, 2020
- [2] C Chen, C Qin, H Qiu, G Tarroni, **J Duan**, et al. Deep learning for cardiac image segmentation: A review. **Frontiers in Cardiovascular Medicine**, 7, 25, 2020
- [3] A Phua, T Le, S Tara, A Marvao, **J Duan**, et al. Paradoxical higher myocardial wall stress and increased cardiac remodeling despite lower mass in females. **Journal of the American Heart Association**, 9(4), e014781, 2020
- [4] **J Duan**, et al. Automatic 3D bi-ventricular segmentation of cardiac images by a shape-refined multi-task deep learning approach. **IEEE Transactions on Medical Imaging**, 38(9), 2151-2164, 2019
- [5] W Xie, L Shen, **J Duan**. Adaptive weighting of handcrafted feature losses for facial expression recognition. **IEEE Transactions on Cybernetics**, 1-14, 2019
- [6] G Bello, T Dawes, **J Duan**, et al. Deep learning cardiac motion analysis for human survival prediction. **Nature Machine Intelligence**, 1(2), 95-104, 2019
- [7] J Spencer, K Chen, **J Duan**. Parameter-free selective segmentation with convex variational methods. **IEEE Transactions on Image Processing**, 28(5), 2163-2172, 2019
- [8] G Hou, Z Pan, G Wang, H Yang, **J Duan**. An efficient nonlocal variational method with application to underwater image restoration. **Neurocomputing**, 369, 106-121, 2019
- [9] Y Mu, B Huang, Z Pan, H Yang, G Hou, **J Duan**. An enhanced high-order variational model based on speckle noise removal with  $G^0$  distribution. **IEEE Access**, 7, 104365-104379, 2019
- [10] B Huang, Y Mu, Z Pan, B Li, H Yang, **J Duan**. Speckle noise removal convex method using higher-order curvature variation. **IEEE Access**, 7, 79825-79838, 2019
- [11] W Lu, **J Duan**, et al. New nonlocal forward model for diffuse optical tomography. **Biomedical Optics Express**, 10(12), 6227-6241, 2019
- [12] W Lu, **J Duan**, et al. Graph-and finite element-based total variation models for the inverse problem in diffuse optical tomography. **Biomedical Optics Express**, 10(6), 2684-2707, 2019
- [13] R Liu, Y Wei, S Lin, **J Duan**, et al. Undersampled CS image reconstruction using nonconvex nonsmooth mixed constraints. **Multimedia Tools and Applications**, 78(10), 12749-12782, 2019
- [14] P Zhuang, X Ding, **J Duan**. Subspace-based non-blind deconvolution, **Mathematical Biosciences and Engineering**. 16(4), 2202-2218, 2019
- [15] 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
- [16] **J Duan**, et al. Introducing diffusion tensor to high order variational model for image reconstruction. **Digital Signal Processing**, 69(2017), 323-336, 2017
- [17] **J Duan**, et al. Automated segmentation of retinal layers from optical coherent tomography images using geodesic distance. **Pattern Recognition**, 72(2017), 158-175, 2017
- [18] D Yang, G Subramanian, **J Duan**, et al. A portable image-based cytometer for rapid Malaria detection and quantification. **PloS ONE**, 12(6), e0179161, 2017
- [19] W Xie, **J Duan**, et al. Open snake model based on global guidance field for embryo vessel location. **IET Computer Vision**, 12(2), 129-137, 2017
- [20] X Tai, **J Duan**. A simple fast algorithm for minimization of the elastica energy combining binary and level set representations. **International Journal of Numerical Analysis and Modeling**, 14(6), 809-821, 2017
- [21] **J Duan**, et al. Denoising optical coherence tomography using second order total generalised variation decomposition. **Biomedical Signal Processing and Control**, 24(2016), 120-127, 2016
- [22] **J Duan**, et al. An edge-weighted second order variational model for image decomposition. **Digital Signal Processing**, 49(2016), 162-181, 2016
- [23] **J Duan**, et al. New second order Mumford-Shah model based on  $\Gamma$ -convergence approximation for image processing. **Infrared Physics Technology**, 76, 641-647, 2016
- [24] W Lu, **J Duan**, et al. Implementation of high-order variational models made easy for image processing. **Mathematical Methods in the Applied Sciences**, 39(14), 4208-4233, 2016

- [25] Y Ding, P Marie, A Alessandra, F Henryk, **J Duan**, et al. Novel methods for microglia segmentation, feature extraction, and classification. **IEEE/ACM Transactions on Computational Biology and Bioinformatics**, 14(6), 1366-1377, 2016
- [26] G Wang, Q Dong, Z Pan, W Zhang, **J Duan**, et al. Retinex theory based active contour model for segmentation of inhomogeneous images. **Digital Signal Processing**, 50, 43-50, 2016
- [27] **J Duan**, et al. New variational image decomposition model for simultaneously denoising and segmenting optical coherence tomography images. **Physics in Medicine and Biology**, 60(22), 8901-8922, 2015
- [28] Y Ding, W Ward, **J Duan**, et al. Retinal vasculature classification using novel multifractal features. **Physics in Medicine and Biology**, 60(21), 8365-8379, 2015
- [29] **J Duan**, et al. Fast algorithms for color texture image inpainting using the non-local CTV model. **Journal of Global Optimization**, 62(4), 853-876, 2015
- [30] **J Duan**, et al. Some fast projection methods based on Chan-Vese model for image segmentation. **EURASIP Journal on Image and Video Processing**, 1, 7, 2014.

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#### Conference Papers:

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- [1] W Lu, X Jia, W Xie, L Shen, Y Zhou, **J Duan**. [Geometry constrained weakly supervised object localization](#). **European Conference On Computer Vision (ECCV)**, 2020, Accepted
- [2] W Chen, X Jia, H Chang, **J Duan**, et al. G2L-Net: Global to local network for real-time 6D pose estimation with embedding vector features. **IEEE Conference on Computer Vision and Pattern Recognition (CVPR)**, 4233-4242, 2020
- [3] W Chen, **J Duan**, et al. PpNet: Point pose network for robust 6d object pose estimation. **IEEE Winter Conference on Applications of Computer Vision (WACV)**, 2824-2833, 2020
- [4] C Qin, J Schlemper, **J Duan**, et al. k-t NEXT: Dynamic MR image reconstruction exploiting spatio-temporal correlations. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 505-513, 2019
- [5] W Bai, C Chen, G Tarroni, **J Duan**, et al. Self-supervised learning for cardiac mr image segmentation by anatomical position prediction. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 541-549, 2019
- [6] C Ouyang, K Kamnitsas, C Biffi, **J Duan**, et al. Data efficient unsupervised domain adaptation for cross-modality image segmentation. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 669-677, 2019
- [7] W Lu, **J Duan**, et al. A new forward model for diffuse optical tomography. **European Conference on Biomedical Optics**, 11074-83, 2019.
- [8] Y Liu, X Jia, L Shen, Z Ming, **J Duan**. Local Normalization Based BN Layer Pruning. **International Conference on Artificial Neural Networks**, 334-346, 2019
- [9] **J Duan**, et al. VS-Net: Variable splitting network for accelerated parallel MRI reconstruction. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 713-722, 2019
- [10] **J Duan**, et al. Deep nested level sets: Fully automated segmentation of cardiac MR images in patients with pulmonary hypertension. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 595-603, 2018
- [11] J Schlemper, O Oktay, W Bai, **J Duan**, et al. Cardiac MR segmentation from undersampled k-space using deep latent representation learning. **Medical Image Computing and Computer Assisted Intervention (MICCAI)**, 259-267, 2018
- [12] **J Duan**, et al. OCT segmentation: Integrating open parametric contour model of the retinal layers and shape constraint to the Mumford-Shah functional. **International Workshop on Shape in Medical Imaging**, 178-188, 2018
- [13] **J Duan**, et al. Combining deep learning and shape priors for bi-ventricular segmentation of volumetric CMR images. **International Workshop on Shape in Medical Imaging**, 258-267, 2018
- [14] J Schlemper, D Castro, W Bai, C Qin, O Oktay, **J Duan**, et al. Bayesian deep learning for accelerated MR image reconstruction. **International Workshop on Machine Learning for Medical Image Reconstruction**, 64-71, 2018
- [15] **J Duan**, et al. Surface reconstruction from point clouds using a novel variational model. **International Conference on Innovative Techniques and Applications of Artificial Intelligence**, 135-146, 2015
- [16] **J Duan**, et al. Optical coherence tomography image segmentation. **IEEE International Conference on Image Processing (ICIP)**, 4278-4282, 2015
- [17] **J Duan**, et al. Second order Mumford-Shah model for image denoising. **IEEE International Conference on Image Processing (ICIP)**, 4278-4282, 2015

[18] **J Duan**, et al. Second order variational model for image decomposition using split Bregman algorithm. **International Conference on Intelligent Science and Big Data Engineering**, 626-636, 2015

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#### Conference Abstracts:

[1] C Qin, J Schlemper, K Hammernik, **J Duan**, et al. Deep network interpolation for accelerated parallel MR image reconstruction. **International Society for Magnetic Resonance in Medicine (ISMRM)**, #4958, 2020

[2] C Qin, J Schlemper, K Hammernik, **J Duan**, et al.  $\Sigma$ -Net: Ensembled iterative deep neural networks for accelerated parallel MR image reconstruction. **International Society for Magnetic Resonance in Medicine (ISMRM)**, #0602, 2020

[3] J Schlemper, I Oksuz, J Clough, **J Duan**, et al. "dAUTOMAP: decomposing AUTOMAP to achieve scalability and enhance performance. **International Society for Magnetic Resonance in Medicine (ISMRM)**, #0658, 2019

[4] J Schlemper, **J Duan**, et al. Data consistency networks for (calibration-less) accelerated parallel MR image reconstruction. **International Society for Magnetic Resonance in Medicine (ISMRM)**, #4663, 2019

[5] G Bello, T Dawes, **J Duan**, et al. Using three-dimensional cardiac motion for predicting mortality in pulmonary hypertension: A deep learning approach. **Medical Imaging with Deep Learning (MIDL)**, 2018.

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## PRESENTATIONS

- **Cardiac magnetic resonance image segmentation with anatomical knowledge**

*Invited talk for Data Science and Computational Statistics Seminar 2020 (Jul)*

- **Medical Image Computing and Computer Assisted Intervention (MICCAI) conference 2019**

*Oral talk for 3000+ audiences about accelerated parallel MRI reconstruction*

- **Exhibition at Science Museum London Lates 2018**

*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*

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## 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, CUDA, Slurm, and various Python libraries such as SimpleITK, Scikit-learn, OpenCV, etc.
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## PROFESSORIAL SERVICES

- Co-organiser of Data Science and Computational Statistics Seminar at University of Birmingham
  - Program Committee for Thirty-Fifth AAAI Conference on Artificial Intelligence.
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## ADMINISTRATION JOBS

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- Offer Holder
  - Open Day Tutor
  - Invigilator
  - Outreach
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## PHD SUPERVISION

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- [Tianyang Zhang](#). Research topic: image translation and generative adversarial network
  - [Xi Jia](#). Research topic: data- and model-driven image registration
  - [Wei Chen](#), jointly supervised with Prof Ales Leonardis. Research topic: 6d object pose estimation
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## REVIEWER FOR

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• IEEE Transaction on Image Processing • IEEE Transaction on Medical Imaging • IEEE Transactions on Neural Networks and Learning Systems • IEEE Transactions on Emerging Topics in Computational Intelligence • IEEE Transactions on NanoBioscience • 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 • Neurocomputing • Computerized Medical Imaging and Graphics • NMR in Biomedicine • Journal of Computer Science and Technology • AAAI

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## OTHER AWARDS

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- Chinese Government Award for Outstanding Self-funded Students, 2016 (500 people across the globe)
  - Travel grant to 2nd International MATHEON Conference on Compressed Sensing and its Applications
  - Travel grant to International Conference on Intelligence Science and Big Data Engineering
  - Best Master Thesis Award in Shandong Province, China, 2015 (10 people)
  - 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 to support my master thesis, 2013 (1 people in the School)
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