

# CHRISTOPHER PHILIP BRIDGE, D.Phil.

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Citizenship: British

Last Updated: February, 2019

## EMPLOYMENT HISTORY

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- **MGH & BWH Center for Clinical Data Science** **Boston, MA, USA**  
*Data Science Innovation Fellow* 2017 – 2018  
*Machine Learning Scientist* 2018 – Present  
*Postdoctoral Research Fellow* 2019 – Present

The CCDS was recently founded at Massachusetts General Hospital (MGH) and Brigham and Women's Hospital (BWH) with the aim of leveraging the medical expertise and clinical data available at the hospitals in order to bring latest advances in artificial intelligence into clinical practice. I work with clinicians to develop deep learning models for analysis of data within a range of medical specialisms, and conduct and enable original research into deep learning for healthcare.

- **Selex Galileo (now part of Leonardo-Finmeccanica)** **Basildon, UK**  
*Software and Hardware Engineering Summer Placement Student* 2010 – 2012

Selex is an international company providing electronic solutions in a range of sectors including defence, aerospace, space and security. I undertook three summer work placements within software and electronic engineering at the company during the course of my undergraduate degree, each of around 10 weeks.

## EDUCATION

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- **University of Oxford, Balliol College** **Oxford, UK**  
*D.Phil., Engineering Science* 2013 – 2017

- Thesis title: *Computer-Aided Analysis of Fetal Cardiac Ultrasound Videos*
- Supervisor: Prof. Alison Noble, Associate Head of Mathematical, Physical & Life Sciences Division
- EPSRC Doctoral Training Award – provides full tuition fees and living stipend
- IET Travel Award 2015 – for travel to the International Symposium on Biomedical Imaging

- **University of Cambridge, Pembroke College** **Cambridge, UK**  
*M.Eng. (Distinction), Engineering* 2012 – 2013  
*B.A. (First Class Honours), Engineering* 2009 – 2012

- Specialism in Information and Computer Engineering
- AT&T Laboratories Prize for best overall final year performance in Electrical and Information Sciences (2013)
- First class honours in every set of university examinations, and the research project
- Information Division prize for Best Research Presentation (2013)
- Pembroke College Scholarship (2010), Foundation Scholarship (2011, 2012), College Prize (2010, 2011, 2012), and Ronald Wynn Prize (2013), all for examination performance
- IET National Electronics Council Scholarship (2009 – 2013)

- **King Edward VI Grammar School** **Chelmsford, UK**  
*6 A-levels at Grade A, 13 GCSEs at Grade A\** 2002 – 2009

## RESEARCH EXPERIENCE

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- **Doctoral Research**  
*Institute of Biomedical Engineering, University of Oxford*

My doctoral research focused on medical ultrasound video imagery, and in particular I applied techniques from Computer Vision and Machine Learning to develop software tools to assist diagnostic procedures. I built statistical models that leverage spatial and temporal context to recognise structures, viewing planes and other variables of interest in ultrasound scan videos of the fetal heart fully automatically and at real-time speeds. More information can be found on my personal website at <https://chrisbridge.science>.

- **Masters Research**

Cambridge University Engineering Department, University of Cambridge

My *M.Eng.* project, supervised by Dr. Andrew Gee in the Medical Imaging Group, focused on investigating and improving an existing registration methodology for femur surfaces obtained from *in vivo* computed tomography scans. I contributed to the wxRegSurf tool, which is available online at <http://mi.eng.cam.ac.uk/~ahg/wxRegSurf/>.

## SELECTED PUBLICATIONS

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For a full, up-to-date list, please visit <https://chrisbridge.science/publications>.

### Conference Proceedings

- **C.P. Bridge**, M. Rosenthal et al., “Fully-Automated Analysis of Body Composition from CT in Cancer Patients Using Convolutional Neural Networks”, *Workshop on Clinical Image-Based Procedures (CLIP), MICCAI*, Granada 2018
- W. Huang, **C.P. Bridge**, J.A. Noble, and A. Zisserman, “Temporal HeartNet: Towards Human-Level Automatic Analysis of Fetal Cardiac Screening Video”, *MICCAI*, Québec City 2017, pp. 341–349
- **C.P. Bridge**, C. Ioannou and J.A. Noble, “Localizing Cardiac Structures in Fetal Heart Ultrasound Video”, *Machine Learning in Medical Imaging Workshop, MICCAI 2017*, pp. 246–255
- V. Sundaresan, **C.P. Bridge**, C. Ioannou, and J.A. Noble, “Automated Characterisation Of The Fetal Heart In Ultrasound Images Using Fully Convolutional Neural Networks”. *IEEE International Symposium on Biomedical Imaging*, Melbourne, April 2017, pp. 671–674
- **C.P. Bridge** and J.A. Noble, “Object Localisation In Fetal Ultrasound Images Using Invariant Features”. *Proceedings of the IEEE International Symposium on Biomedical Imaging*, New York City, 2015

### Journal Articles

- **C.P. Bridge**, C. Ioannou, and J.A. Noble, “Automated Annotation and Quantitative Description of Ultrasound Videos of the Fetal Heart”. *Medical Image Analysis* 36, February 2017, pp. 147–161
- M.A. Maraci, **C.P. Bridge**, R. Napolitano, A. Papageorghiou, and J.A. Noble, “A Framework for Analysis of Linear Ultrasound Videos to Detect Fetal Presentation and Heartbeat”. *Medical Image Analysis* 37, April 2017, pp. 22–36

## PEER REVIEW

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I have reviewed submissions for the following journals and conferences:

- International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI), (Reviewer Commendation 2018)
- International Conference on Medical Imaging with Deep Learning (MIDL)
- IEEE Transaction on Medical Imaging
- PLoS One

## POSITIONS OF RESPONSIBILITY

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- **Laboratory Demonstrator** *Department of Engineering Science, University of Oxford (2014 – 2016)*  
I have demonstrated for several undergraduate and postgraduate laboratory sessions in the area of biomedical image analysis, covering image segmentation and registration, and machine learning.

## SKILLS

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**Computing:** Python (experienced, including SciPy stack and OpenCV, Tensorflow and Keras deep learning frameworks), C++ (experienced, including C++11, OpenGL, OpenCV, OpenMP, Boost and Eigen libraries), MATLAB (competent, including Image Processing, Optimisation and Computer Vision toolboxes), bash (competent), Rust (beginner), Docker, GPU programming with CUDA and associated libraries, Linux-based operating systems,  $\LaTeX$ , Git