

CHRISTOPHER PHILIP BRIDGE

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Citizenship: British

PROFESSIONAL EXPERIENCE

- **MGH and BWH Center for Clinical Data Science** **Boston, MA, USA**
Innovation Fellow (Data Science) 2017 – 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. My role as a data scientist at the center involves working with clinicians to develop deep learning models for analysis of data within a range of medical specialisms.
- **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 and information solutions in a range of sectors including defence, aerospace, space and security. I undertook three summer work placements at the company during the course of my undergraduate degree, each of around 10 weeks in length. During this time I worked in a variety of the company's project teams within both electrical and software engineering.

EDUCATION

- **University of Oxford, Balliol College** **Oxford, UK**
D.Phil., Engineering Science 2013 – 2017
 - Thesis title: *Computer-Aided Analysis of Fetal Cardiac Ultrasound Videos*
 - Supervisor: Professor Alison Noble, Associate Head of Mathematical, Physical and Life Sciences Division
 - Funding: EPSRC Doctoral Training Award – provides full university and college fees and living stipend
 - IET Travel Award 2015, for travel to the International Symposium on Biomedical Imaging
- **University of Cambridge, Pembroke College** **Cambridge, UK**
B.A. (First Class Honours) and M.Eng. (Distinction), Engineering Specialism in Information and Computer Engineering 2009 – 2013
 - AT&T Laboratories Prize for best overall final year performance in Electrical and Information Science (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

- **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, focussed on investigating and improving an existing registration methodology for femur surfaces obtained from *in vivo* computed tomography scans. My contributions included investigating alternative point matching schemes to reduce the problem of registration failures, and investigating an alternative, *locally affine* transformation method to reduce unwanted distortion to the structure of the mesh. I contributed to the wxRegSurf tool, which is available online at <http://mi.eng.cam.ac.uk/~ahg/wxRegSurf/>.

SELECTED PUBLICATIONS

Conference Proceedings

- 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
- M.A. Maraci, **C.P. Bridge**, J.A. Noble, C. Aye, M. Molloholli, R. Napolitano, A.T. Papageorghiou, “Towards automating the ISUOG ‘six-step basic ultrasound’ scan”. *Abstracts of the 25th World Congress on Ultrasound in Obstetrics and Gynecology*, Montreal 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

POSITIONS OF RESPONSIBILITY

- **Laboratory Demonstrator** *Department of Engineering Science, University of Oxford (2014 – 2016)*
I have demonstrated for several undergraduate and graduate laboratory sessions in the area of biomedical image analysis, covering image segmentation and registration, and machine learning applied to medical images.
- **Entertainments Officer** *Balliol College Middle Common Room (MCR) Garden Party Committee (2014)*
Part of a committee of 10 graduate students organising the college graduate community’s largest annual social event, with a budget of over £20,000. My role involved arranging musical and other entertainment.
- **Team Captain** *Pembroke College Badminton Club (2012 – 2013)*
I was responsible for training a team of around 10 players at weekly training sessions and organising several league matches a term, as well as other administrative responsibilities within the club.
- **Secretary** *Pembroke College Music Society (2012)*
I had responsibility for much of the society’s paperwork, organising and minuting meetings, and helping to organise and run weekly recitals, termly concerts, and other social events.

SKILLS

Computing: C++ (including C++11, OpenGL, OpenCV, OpenMP, Boost and Eigen libraries), MATLAB (including Image Processing, Optimisation and Computer Vision toolboxes), Python (including SciPy stack and OpenCV), Tensorflow and Keras deep learning frameworks, Docker, GPU programming with CUDA and associated libraries, Linux-based operating systems, L^AT_EX, Git

Languages: Basic French and German

Music: Clarinet, saxophone, acoustic and electric guitar