

John Chiverton
Lecturer
School of Engineering
Centre for Healthcare Modelling and Informatics
Email: john.chiverton@port.ac.uk



Biography

I studied Electronic and Computer Engineering at the University of Brighton. I worked as a software engineer at Voxar, Edinburgh until Summer 2001, and studied for a Electronic Engineering Masters at the University of Surrey with a medical image analysis research project.

In 2002, I commenced my PhD under the supervision of Dr Kevin Wells in the area of medical image analysis applied to MRI, PET and CT modalities, specifically analysis of regions consisting of multiple classes (partial volumes). I developed Bayesian probabilistic models to segment regions of the brain.

After successfully completing my PhD in 2006, I worked for two years as a postdoctoral researcher at the University of Bristol on the analysis of video and multidimensional imaging data with Professor Majid Mirmehdi and Dr Xianghua Xie. This work was more generally applicable, not just to medical images and found particular application to the tracking of objects in video data.

From January 2009 to August 2013, I worked as a computer engineering lecturer and researcher at Mae Fah Luang University, Thailand in the School of Information Technology.

In August 2013, I joined the School of Engineering, University of Portsmouth, UK as a lecturer, teaching digital signal processing, digital electronics, video coding and related areas.

Undergraduate and Master's project topics that I have to offer include projects on medical image analysis, image processing, computer vision, signal processing.

Research Interests

I am currently working on techniques for the automated analysis of 3D imaging data and video data with applications including modelling of steel fibre reinforced concrete, traffic safety and wildlife monitoring. I am also continuing my research in the area of medical image analysis. I am also supervising graduate projects in the areas of signal processing.

Research output

Multi-step time series forecasting of electric load using machine learning models

Shamsul Masum, Dr Ying Liu & Dr John Chiverton Jun 2018 *17th International Conference on Artificial Intelligence and Soft Computing: ICAISC 2018*. Rutkowski, L., Scherer, R., Korytkowski, M., Pedrycz, W., Tadeusiewicz, R. & Zurada, J. (eds.). Springer Nature, p. 148-159 12 p. (Lecture Notes in Computer Science ; vol. 10841)

Orientation distribution and mean width determination in micro X-Ray CT images of fibrous materials

Dr John Chiverton, Dr Alex Kao, Dr Gianluca Tozzi & Dr Marta Roldo 21 May 2018 *IET 3rd International Conference on Intelligent Signal Processing (ISP 2017)*. London, UK: IET Conference Publications, p. 1-6 6 p.

Automatic diameter and orientation distribution determination of fibrous materials in micro x-ray CT imaging data

Dr John Chiverton, Dr Alex Kao, Dr Marta Roldo & Dr Gianluca Tozzi 10 May 2018 (Accepted for publication) In : *Journal of Microscopy*.

Efficient and low complexity optimized feature spectrum sensing with receiver offsets

Ikedieze Gabriel Anyim, Dr John Chiverton, Dr Misha Filip & Dr Abdulkarim Tawfik 13 Dec 2017 (Accepted for publication) *2018 IEEE Wireless Communications and Networking Conference*. IEEE, 6 p.

The implementation of wideband cyclostationary feature detector with receiver constraints

Ikedieze Gabriel Anyim, Dr John Chiverton, Dr Misha Filip & Dr Abdulkarim Tawfik 17 Jul 2017 *2017 European Conference on Networks and Communications (EuCNC)*. IEEE, 5 p.

Multiscale Shannon's entropy modelling of orientation and distance in steel fiber micro-tomography data

Dr John Chiverton, Ige, O., Dr Stephanie Barnett & Parry, T. 30 Jun 2017 In : *IEEE Transactions on Image Processing*. 26, 11, p. 5284-5297

Effects of steel fibre-aggregate interaction on mechanical behaviour of steel fibre reinforced concrete

Ige, O., Dr Stephanie Barnett, Dr John Chiverton, Dr Ayman Nassif & Professor John Williams 3 Apr 2017 In : *Advances in Applied Ceramics*. 116, 4, p. 193-198

Alan Blumlein: the prolific British inventor who gave the world stereophonic sound

Dr John Chiverton 10 Feb 2017 *The Conversation*

Activity recognition from video data using spatial and temporal features

Al-Wattar, M., Dr Rinat Khusainov, Dr Djamel Azzi & Dr John Chiverton 27 Oct 2016 *2016 12th International Conference on Intelligent Environments*. IEEE, p. 250-253 4 p.

Detecting and tracking bottoms and faces of the crested black macaque in the wild

Dr John Chiverton, Dr Jerome Micheletta & Professor Bridget Waller 10 Sep 2015 *Proceedings of the Machine Vision of Animals and their Behaviour Workshop (MVAB) 2015*. Xie, X., Jones, M. & Tam, G. (eds.). British Machine Vision Association, p. 1-8

Partial volume modelling of medical imaging systems using the Benford Distribution

Dr John Chiverton & Wells, K. 2015 *Benford's Law: theory & applications*. Miller, S. J. (ed.). New Jersey: Princeton University Press, p. 319-337 18 p.

Helmet presence classification with motorcycle detection and tracking

Dr John Chiverton Sep 2012 In : *IET Intelligent Transport Systems*. 6, 3, p. 259 1 p.

Automatic bootstrapping and tracking of object contours

Dr John Chiverton, Xie, X. & Mirmehdi, M. Mar 2012 In : *IEEE Transactions on Image Processing*. 21, 3, p. 1231-1245 15 p.

On-line learning of shape information for object segmentation and tracking

Dr John Chiverton, Mirmehdi, M. & Xie, X. 2009 *Proceedings of the British Machine Vision Conference*. Cavallaro, A., Prince, S. & Alexander, D. (eds.). British Machine Vision Association, p. 1-10

Variational Maximum A Posteriori model similarity and dissimilarity matching

Dr John Chiverton, Mirmehdi, M. & Xie, X. 1 Dec 2008 *19th International conference on pattern recognition, 2008. ICPR 2008*. Piscataway: IEEE/ IAPR, p. 1-4

Adaptive partial volume classification of MRI data

Dr John Chiverton & Wells, K. 21 Oct 2008 In : *Physics in Medicine and Biology*. 53, 20, p. 5577-5594 18 p.

Tracking with active contours using dynamically updated shape information

Dr John Chiverton, Xie, X. & Mirmehdi, M. 2008 *Proceedings of the British Machine Vision Conference 2008 (Leeds, September 2008)*. Everingham, M., Needham, C. J. & Fraile, R. (eds.). British Machine Vision Association, p. 1-10

Quantifying the partial volume effect in PET using Benford's Law

Wells, K., Dr John Chiverton, Partridge, M., Barry, M., Kadhem, H. & Ott, R. 1 Oct 2007 In : *IEEE Transactions on Nuclear Science*. 54, 5, p. 1616-1625 10 p.

Statistical morphological skull stripping of adult and infant MRI data

Dr John Chiverton, Wells, K., Lewis, E., Chen, C., Podda, B. & Johnson, D. 1 Mar 2007 In : *Computers in Biology and Medicine*. 37, 3, p. 342-357 16 p.

Mixture effects in FIR low-pass filtered signals

Dr John Chiverton & Wells, K. 1 Jun 2006 In : *IEEE Signal Processing Letters*. 13, 6, p. 369-372 4 p.

A combined noise reduction and partial volume estimation method for image quantitation

Dr John Chiverton, Wells, K. & Partridge, M. 2006 *IEEE 2006 Nuclear Science Symposium and Medical Imaging Conference Record*. Piscataway: IEEE, p. 3221 - 3228

Correction for partial volume effect in arterial input functions

Rodriguez, D., Dr John Chiverton & Wells, K. 2006 *Abstracts 22th Annual Scientific Meeting European Society Magnetic Resonance Medicine and Biology*. Warsaw, Poland: European Society for Magnetic Resonance in Medicine and Biology, p. 329

Partial volume correction for image-generated arterial input functions

Gutierrez, D. R., Dr John Chiverton, Wells, K. & Partidge, M. 2006 *IEEE 2006 Nuclear science symposium conference record*. Philips, B. (ed.). Piscataway: IEEE, Vol. 4, p. 2091 - 2094

Probabilistic partial volume modelling of biomedical tomographic image data

Dr John Chiverton 2006 Guildford, Surrey: University of Surrey. 283 p.

The partial volume effect in PET/SPECT and Benford's Law

Wells, K., Dr John Chiverton, Partridge, M., Barry, M., Kadhemi, H. & Ott, B. 2005 *IEEE 2005 Nuclear Science Symposium and Medical Imaging Conference Record*. Piscataway: IEEE, Vol. 3, p. 1-5

Fully automatic skull stripping of routine clinical neurological NMR data

Dr John Chiverton, Podda, B., Chen, C., Wells, K. & Johnson, D. 2004 *IEEE 2004 Nuclear science Symposium and Medical Imaging Conference Record*. Piscataway: IEEE, Vol. 4, p. 2669 - 2673

Modelling 3D voxel slope for partial volume quantification

Dr John Chiverton & Wells, K. 2004 *Annual scientific meeting*. York: Institute of Physics and Engineering in Medicine

Volumetric partial volume quantification via a statistical model of 3D voxel gradient magnitude

Dr John Chiverton & Wells, K. 2004 *IEEE 2004 Nuclear Science Symposium and Medical Imaging Conference Record*. Piscataway: IEEE, Vol. 7, p. 4106 - 4110