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Biography

John is a lecturer in Digital Signal Processing, Measurement, Circuits and Video Data at UoP and has worked in signal and image processing for twenty years with some established collaborators and a track record of supporting research projects at Surrey, Bristol and Portsmouth, including funding from Google and Mitsui Sumitomo Insurance Welfare Foundation. He began academic research with a doctoral training grant in the Centre for Vision, Speech and Signal Processing (CVSSP) at Surrey in the early 2000s, investigating medical image analysis applied to MRI, PET and CT. He is a MIET. He received awards from IEEE and IPEM and has been the PI for projects concerning the manipulation of data, especially applied to fibrous materials, forecasting of blood pressure and identifying people and their actions.

Research Interests

John leads work on techniques for the automated analysis of 3D imaging data. The work is multidisciplinary - spanning multiple disciplines but concentrating on feature extraction and quantitative inference. The work has been successfully applied to fibrous materials, forecasting of blood pressure and identifying people and their actions. This includes applications to image analysis of XCT for nano-fibres for biomedical and health applications and steel fibre reinforced concrete. John is also working on automated video processing techniques with applications including assisted living and more general action recognition. John is happy to supervise graduate and research projects in these areas and more generally in the fields of signal and image processing.

Research output

Vision based dynamic thermal comfort control using fuzzy logic and deep learning

Al-Faris, M., Chiverton, J., Ndzi, D. & Ahmed, A. I., 19 May 2021, In: Applied Sciences (Switzerland). 11, 10, 17 p., 4626.

Intelligent control and HCI for a powered wheelchair using a simple expert system and ultrasonic sensors

Sanders, D., Haddad, M., Omoarebun, P., Ikwan, F., Chiverton, J., Zhou, S., Rogers, I. & Vatchova, B., 25 Aug 2020, *Intelligent Systems and Applications: Proceedings of the 2020 Intelligent Systems Conference (IntelliSys) Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 571-583 13 p. (Advances in Intelligent Systems and Computing; vol. 1252).

Introducing time-delays to analyze driver reaction times when using a powered wheelchair

Sanders, D., Haddad, M., Langner, M., Omoarebun, P., Chiverton, J., Hassan, M., Zhou, S. & Vatchova, B., 25 Aug 2020, *Intelligent Systems and Applications: IntelliSys Volume 3*. Arai, K., Kapoor, S. & Bhatia, R. (eds.). Springer, p. 559-570 12 p. (Advances in Intelligent Systems and Computing; vol. 1252).

Volumetric simulation of nano-fibres and 2D SEM and 3D XCT imaging processes

Chiverton, J., Kao, A., Roldo, M. & Tozzi, G., 8 Jul 2020, *MIUA: Medical Image Understanding and Analysis: 24th Conference, MIUA 2020, Oxford, UK, July 15th-17th July 2020*. Springer, Vol. CCIS 1248. p. 436-445 10 p. (Communications in Computer and Information Science).

A review on computer vision-based methods for human action recognition

Al-Faris, M. M. N., Chiverton, J., Ndzi, D. L. & Ahmed, A. I., 10 Jun 2020, In: Journal of Imaging. 6, 32 p., 6:46.

Multi-view region-adaptive multi-temporal DMM and RGB action recognition

Al-Faris, M. M. N., Chiverton, J., Yang, L. & Ndzi, D., 21 Apr 2020, (Early online) In: Pattern Analysis & Applications. 16 p.

Fiber-based composite meshes with controlled mechanical and wetting properties for water harvesting

Knapczyk-Korczak, J., Ura, D. P., Gajek, M., Marzec, M. M., Berent, K., Bernasik, A., Chiverton, J. & Stachewicz, U., 10 Dec 2019, In: ACS Applied Materials & Interfaces. 12, 1, p. 1665-1676 12 p.

Investigation of machine learning techniques in forecasting of blood pressure time series data

Masum, S., Chiverton, J., Liu, Y. & Vuksanovic, B., 19 Nov 2019, *SGAI 2019: Artificial Intelligence XXXVI. Thirty-ninth SGAI International Conference on Artificial Intelligence: International Conference on Innovative Techniques and Applications of Artificial Intelligence*. Bramer, M. & Petridis, M. (eds.). Springer, Vol. 11927. p. 269-282 14 p. (Lecture Notes in Computer Science)(Lecture Notes in Artificial Intelligence).

Deep learning of fuzzy weighted multi-resolution depth motion maps with spatial feature fusion for action recognition

Al-Faris, M. M. N., Chiverton, J., Yang, L. & Ndzi, D., 21 Oct 2019, In: *Journal of Imaging*. 5, 10, 25 p., 82.

Speaker recognition using PCA-based feature transformation

Ahmed, A. I., Chiverton, J. P., Ndzi, D. L. & Becerra, V. M., Jul 2019, In: *Speech Communication*. 110, p. 33-46 14 p.

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

Chiverton, J., Kao, A., Roldo, M. & Tozzi, G., 26 Nov 2018, In: *Journal of Microscopy*. 272, 3, p. 180-195 16 p.

Practical action recognition with manifold regularized sparse representation

Zhang, L., Khusainov, R. & Chiverton, J., 6 Sep 2018, *The British Machine Vision Conference*. British Machine Vision Association, 11 p.

Comparative analysis of the outcomes of differing time series forecasting strategies

Masum, S., Liu, Y. & Chiverton, J., 25 Jun 2018, *2017 13th International Conference on Natural Computation, Fuzzy Systems and Knowledge Discovery (ICNC-FSKD)*. Liu, Y., Zhao, L., Cai, G., Xiao, G., Li, K. & Wang, L. (eds.). Guilin: Institute of Electrical and Electronics Engineers, p. 1964-1968 5 p.

Efficient and low complexity optimized feature spectrum sensing with receiver offsets

Anyim, I. G., Chiverton, J., Filip, M. & Tawfik, A., 11 Jun 2018, *2018 IEEE Wireless Communications and Networking Conference*. IEEE, p. 2441-2446 6 p. (IEEE WCNC Proceedings Series).

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

Masum, S., Liu, Y. & Chiverton, J., 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).

Appearance and motion information based human activity recognition

Al-Faris, M. M. N., Chiverton, J., Yang, L. & Ndzi, D., 21 May 2018, *IET 3rd International Conference on Intelligent Signal Processing (ISP 2017)*. London, UK: IET Conference Publications, p. 1-6 6 p.

Channel variability synthesis in i-vector speaker recognition

Ahmed, A. I., Chiverton, J., Ndzi, D. & Becerra, V., 21 May 2018, *IET 3rd International Conference on Intelligent Signal Processing (ISP 2017)*. London, UK: IET Conference Publications, p. 1-6 6 p.

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

Chiverton, J., Kao, A., Tozzi, G. & Roldo, M., 21 May 2018, *IET 3rd International Conference on Intelligent Signal Processing (ISP 2017)*. London, UK: IET Conference Publications, p. 1-6 6 p.

The optimization of wideband cyclostationary feature detector with receiver constraints

Anyim, I. G., Chiverton, J., Filip, M. & Tawfik, A., 21 May 2018, *3rd International Conference on Intelligent Signal Processing (ISP 2017)*. London: IET Conference Publications, 6 p.

The implementation of wideband cyclostationary feature detector with receiver constraints

Anyim, I. G., Chiverton, J., Filip, M. & Tawfik, A., 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

Chiverton, J., Ige, O., Barnett, S. & 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., Barnett, S., Chiverton, J., Nassif, A. & Williams, J., 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

Chiverton, J., 10 Feb 2017, The Conversation.

Activity recognition from video data using spatial and temporal features

Al-Wattar, M., Khusainov, R., Azzi, D. & Chiverton, J., 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

Chiverton, J. P., Micheletta, J. F. & Waller, B. M., 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

Chiverton, J. & 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

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

Automatic bootstrapping and tracking of object contours

Chiverton, J., 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

Chiverton, J., 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

Chiverton, J., 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

Chiverton, J. & 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

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

Wells, K., Chiverton, J., 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

Chiverton, J., 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

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Correction for partial volume effect in arterial input functions

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Probabilistic partial volume modelling of biomedical tomographic image data

Chiverton, J., 2006, Guildford, Surrey: University of Surrey. 283 p.

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

Wells, K., Chiverton, J., Partridge, M., Barry, M., Kadhem, 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

Chiverton, J. P., 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

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

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