

Bill Christmas's publications as of August 2, 2016

Journal papers

- [1] Shervin Rahimzadeh Arashloo, Josef Kittler, and William Christmas. Face spoofing detection based on multiple descriptor fusion using multiscale dynamic binarized statistical image features. *IEEE Transactions on Information Forensics and Security*, 10(11):2396–2407, July 2015. pdf.
- [2] Zhen-Hua Feng, Guosheng Hu, Josef Kittler, William Christmas, and Xiao-Jun Wu. Cascaded collaborative regression for robust facial landmark detection trained using a mixture of synthetic and real images with dynamic weighting. *IEEE Transactions on Image Processing*, 24(11):3425–3440, June 2015. pdf.
- [3] David Windridge, Josef Kittler, Teofilo de Campos, Fei Yan, William Christmas, and Aftab Khan. A novel markov logic rule induction strategy for characterizing sports video footage. *IEEE Multimedia*, 22(2):24–35, April 2015. pdf.
- [4] Zhen-Hua Feng, Patrik Huber, Josef Kittler, William Christmas, and Xiao-Jun Wu. Random cascaded-regression copse for robust facial landmark detection. *IEEE Signal Processing Letters*, 22(1):76–80, January 2015. pdf.
- [5] Fei Yan, Josef Kittler, David Windridge, William Christmas, Krystian Mikolajczyk, Stephen Cox, and Qiang Huang. Automatic annotation of tennis games: An integration of audio, vision, and learning. *Image and Vision Computing*, 32(11):896 – 903, November 2014. pdf.
- [6] V. Snell, W.J. Christmas, and J. Kittler. HEp-2 fluorescence pattern classification. *Pattern Recognition*, 47(7):2338–2347, July 2014. Special issue on the analysis and recognition of indirect immuno-fluorescence images; pdf.
- [7] Josef Kittler, William Christmas, Teo de Campos, David Windridge, Fei Yan, John Illingworth, and Magda Osman. Domain anomaly detection in machine perception: a system architecture and taxonomy. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, May 2014. pdf.
- [8] Chi Ho Chan, Budhaditya Goswami, Josef Kittler, and William Christmas. Local ordinal contrast pattern histograms for spatiotemporal, lip-based speaker authentication. *IEEE Transactions on Information, Forensics and Security*, 7(2):602–612, April 2012. pdf.
- [9] M Yip, A Mackenzie, E Lewis, D R Dance, K C Young, W Christmas, and K Wells. Image resampling effects in mammographic image simulation. *Phys. Med. Biol.*, 56(22):275–286, November 2011. pdf.
- [10] Shervin Rahimzadeh Arashloo, Josef Kittler, and William J. Christmas. Pose-invariant face recognition by matching on multi-resolution MRFs linked by supercoupling transform. *Computer Vision and Image Understanding*, 115(7):1073–1083, July 2011. pdf.
- [11] Fei Yan, William Christmas, and Josef Kittler. Layered data association using graph-theoretic formulation with application to tennis ball tracking in monocular sequences.

- IEEE Transactions on Pattern Analysis and Machine Intelligence*, 30(10):1814–1830, October 2008. pdf.
- [12] Myung-Cheol Roh, Bill Christmas, Joseph Kittler, and Seong-Whan Lee. Gesture spotting for low-resolution sports video annotation. *Pattern Recognition*, 41(3):1124–1137, March 2008. pdf.
- [13] Takehito Ogata, William Christmas, Josef Kittler, Joo Kooi Tan, and Seiji Ishikawa. Human activity detection by combining motion descriptors with boosting. *Journal of Information Processing Society of Japan*, 48(3):1166–1175, March 2007. pdf (In Japanese).
- [14] A.J. Fitch, A. Kadyrov, W.J. Christmas, and J. Kittler. Fast robust correlation. *IEEE Transactions on Image Processing*, 14(8):1063–1073, August 2005. pdf.
- [15] A. Kostin, J. Kittler, and W.J. Christmas. Object recognition by symmetrised graph matching using relaxation labelling with an inhibitory mechanism. *Pattern Recognition Letters*, 26(3):381–393, February 2005. Special issue in memory of Professor Azriel Rosenfeld; pdf.
- [16] K. Messer, W.J. Christmas, E. Jaser, J. Kittler, B. Levienaise-Obadia, and D. Koubaroulis. A unified approach to the generation of semantic cues for sports video annotation. *Signal Processing*, 83:357–383, February 2005. Special issue on Content Based Image and Video Retrieval; pdf.
- [17] J. Kittler, Y. Yusoff, W. Christmas, T. Windeatt, and D. Windridge. Boosting multiple experts by joint optimisation of decision thresholds. *Pattern Recognition and Image Analysis*, 11(3):529–541, 2001.
- [18] W.J. Christmas. Filtering requirements for gradient-based optical flow measurement. *IEEE Transactions on Image Processing*, 9(10):1817–1820, October 2000. pdf.
- [19] R. Rambaruth, W. Christmas, and J. Kittler. Interframe texture coding of uncovered regions for a region-based scheme. *Electronics Letters*, 34(17):1655–7, August 1998. pdf.
- [20] J. Kittler, M. Petrou, and W.J. Christmas. A non-iterative probabilistic method for contextual correspondence matching. *Pattern Recognition*, 31(10):1455–1468, October 1998. pdf.
- [21] W.J. Christmas, J. Kittler, and M. Petrou. Probabilistic feature-labelling schemes: modelling compatibility coefficient distributions. *IVC*, 14(8):617–625, August 1996. pdf.
- [22] W.J. Christmas, J. Kittler, and M. Petrou. Labelling 2-D geometric primitives using probabilistic relaxation: reducing the computational requirements. *IEE Electronics Letters*, 32(4):312–314, February 1996. pdf.
- [23] W.J. Christmas, J. Kittler, and M. Petrou. Structural matching in computer vision using probabilistic relaxation. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 17(8):749–764, August 1995. pdf.

Conference papers

- [1] W.P. Koppen, W.J. Christmas, D.J.M. Crouch, W.F. Bodmer, and J.V. Kittler. Extending non-negative matrix factorisation to 3D registered data. In *Proc. ICB 2016*, June 13-16 2016. pdf.
- [2] Patrik Huber, Guosheng Hu, Rafael Tena, Pouria Mortazavian, Willem P. Koppen, William Christmas, Matthias Räscher, and Josef Kittler. A multiresolution 3D morphable face model and fitting framework. In *Proc. VISAPP 2016*, Jan 2016. pdf.
- [3] Guosheng Hu, Yongxin Yang, Dong Yi, Josef Kittler, William Christmas, Stan Li, and Timothy Hospedales. When face recognition meets with deep learning: an evaluation of convolutional neural networks for face recognition. ICCV workshop ChaLearn Looking at People, December 2015. pdf.
- [4] P Huber, Z Feng, W Christmas, J Kittler, and M Räscher. Fitting 3D morphable models using local features. In *Proceeding of the International Conference on Image Processing 2015*, May 2015. pdf.
- [5] G Hu, CH Chan, F Yan, WJ Christmas, and J Kittler. Robust face recognition by an albedo based 3D morphable model. In *International Joint Conference on Biometrics*, October 2014. pdf.
- [6] Zhen-Hua Feng, Josef Kittler, William J Christmas, and Xiaojun Wu. Feature level multiple model fusion using multilinear subspace analysis with incomplete training set and its application to face image analysis. In *MCS*, pages 73–84, 2013. pdf.
- [7] T de Campos, A Khan, F Yan, N FarajiDavar, D Windridge, J Kittler, and W Christmas. A framework for automatic sports video annotation with anomaly detection and transfer learning. In *Proceedings of Machine Learning and Cognitive Science*, Palma de Mallorca, April 2013. pdf.
- [8] Guosheng Hu, Pouria Mortazavian, Josef Kittler, and William Christmas. A facial symmetry prior for improved illumination fitting of 3D morphable model. In *Proceedings of the 6th IAPR International Conference on Biometrics*, 2013. pdf.
- [9] Pouria Mortazavian, Josef Kittler, and William Christmas. 3D morphable model fitting for low-resolution facial images. In *Proceedings of International Conference on Biometrics*, 2012. pdf.
- [10] Paul Koppen, Chi Ho Chan, William Christmas, and Josef Kittler. An intrinsic coordinate system for 3D face. In *Proceeding of ICPR 2012*, pages 2740–2743, Nov 2012. pdf.
- [11] Zhenhua Feng, Josef Kittler, William Christmas, Xiaojun Wu, and Sebastian Pfeiffer. Automatic face annotation by multilinear AAM with missing values (M2AAM). In *Proceeding of ICPR 2012*, Nov 2012. pdf.
- [12] Guosheng Hu, Chi Ho Chan, Josef Kittler, and Bill Christmas. Resolution-aware 3D morphable model. In *Proceedings of the British Machine Vision Conference*, pages 109.1–109.10. BMVA Press, 2012. pdf.

- [13] Violet Snell, William Christmas, and Josef Kittler. Texture and shape in fluorescence pattern identification for auto-immune disease diagnosis. In *Proceeding of ICPR 2012*, Nov 2012. pdf.
- [14] Q Huang, S Cox, F Yan, T E deCampos, D Windridge, J Kittler, and W Christmas. Improved detection of ball hit events in a tennis game using multimodal information. In *11th International Conference on Auditory-Visual Speech Processing*, August 2011. pdf.
- [15] Violet Snell, William Christmas, and Josef Kittler. Segmentation and shape classification of nuclei in DAPI images. In *3rd UK Computer Vision Students' Workshop*. BMVA, September 2011. pdf.
- [16] Chi Ho Chan, Budhaditya Goswami, Josef Kittler, and William Christmas. Kernel-based speaker verification using spatiotemporal lip information. In *Proceedings of IAPR Conference on machine vision applications*, June 2011. pdf.
- [17] B. Goswami, C. Chan, J. Kittler, and W. Christmas. Speaker authentication using video-based lip information. In *IEEE International Conference on Acoustics, Speech and Signal Processing - Proceedings*, pages 1908–1911, May 2011. pdf.
- [18] FarajiDavar N, deCampos TE, Windridge D, Kittler J, and Christmas W. Domain adaptation in the context of sport video action recognition. In *Domain Adaptation Workshop, in conjunction with NIPS*, December 2011. pdf.
- [19] Teofilo de Campos, Mark Barnard, Krystian Mikolajczyk, Josef Kittler, Fei Yan, William Christmas, and David Windridge. An evaluation of bags-of-words and spatio-temporal shapes for action recognition. In *IEEE Workshop on Applications of Computer Vision*, January 2011. pdf.
- [20] I Almajai, F Yan, T de Campos, A Khan, W Christmas, D Windridge, and J Kittler. Anomaly detection and knowledge transfer in automatic sports video annotation. In *Proceedings of DIRAC Workshop, European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases*, September 2010. pdf.
- [21] Aftab Khan, David Windridge, Teofilo de Campos, Josef Kittler, and William Christmas. Lattice-based anomaly rectification for sport video annotation. In *Proceedings of ICPR*, August 2010. pdf.
- [22] Ibrahim Almajai, Josef Kittler, Teo de Campos, William Christmas, Fei Yan, David Windridge, and Aftab Khan. Ball event recognition using HMM for automatic tennis annotation. In *Proceedings of Intl. Conf. on Image Proc.*, September 2010. pdf.
- [23] Shervin Rahimzadeh Arashloo, Josef Kittler, and William Christmas. Facial feature localization using graph matching with higher order statistical shape priors and global optimization. In *Proc. BTAS*, September 2010. pdf.
- [24] Budhaditya Goswami, Chi Ho Chan, Josef Kittler, and William Christmas. Local ordinal contrast pattern histograms for spatiotemporal, lip-based speaker authentication. In *Proceedings of the IEEE Fourth International Conference on Biometrics: Theory, Applications and Systems*, September 2010. Best Student Paper Prize. pdf.

- [25] Pouria Mortazavian, Josef Kittler, and William Christmas. 3D-assisted facial texture super-resolution. In *BMVC*, September 2009. pdf.
- [26] Pouria Mortazavian, Josef Kittler, and William Christmas. A 3D-assisted generative model for facial texture super-resolution. In *Third IEEE International Conference on Biometrics: Theory, Applications and Systems*, pages 452–458. IEEE Press, September 2009. pdf.
- [27] B. Goswami, William J. Christmas, and Josef Kittler. Robust statistical estimation applied to automatic lip segmentation. In *Proceedings of the 4th Iberian Conference on Pattern Recognition and Image Analysis*, pages 200–207, June 2009. pdf.
- [28] Cyril Hory and William J. Christmas. Cepstral features for classification of an impulse response with varying sample size dataset. In *EUSIPCO*, pages 1546–1550, September 2007.
- [29] A. Khan, W.J. Christmas, and J. Kittler. Lip contour segmentation using kernel methods and level sets. In G Bebis et al., editor, *Proc. International Symposium on Visual Computing*, volume 4842–II of *LNCS*, pages 86–95. Springer, 2007.
- [30] F. Yan, W.J. Christmas, and J. Kittler. All pairs shortest path formulation for multiple object tracking with application to tennis video analysis. In *BMVC*, volume 2, pages 650–659, September 2007.
- [31] I. Kolonias, J. Kittler, W.J. Christmas, and F. Yan. Improving the accuracy of automatic tennis video annotation by high level grammar. In *Proc. Int. Conf. on Image Analysis and Processing*, September 2007. This paper was also presented at the VMDL 2007 Workshop.
- [32] Ilias Kolonias, William Christmas, and Josef Kittler. A layered active memory architecture for cognitive vision systems. In *Proc. ICVS 2007*, March 2007.
- [33] Cyril Hory, William Christmas, and Anil Kokaram. Cepstral polynomial regression for sequential detection of impulsive waveform in video sound-track. In *1st International Conference on Semantics and Digital Media Technology*, December 2006.
- [34] B. Goswami, W.J. Christmas, and J. Kittler. Statistical estimators for use in automatic lip segmentation. In *3rd European Conference on Visual Media Production*, pages 79–86, November 2006.
- [35] J.-Y. Guillemaut, J. Kittler, M.T. Sadeghi, and W.J. Christmas. General pose face recognition using frontal face model. In *Proc. Iberoamerican Congress on Pattern Recognition*, volume LNCS 4225, pages 79–88. Springer, November 2006.
- [36] Takehito Ogata, William Christmas, Josef Kittler, and Seiji Ishikawa. Tennis stroke detection and classification based on boosted activity detectors and particle filtering. In *Proc. of Joint Int. Conf. on Soft Computing and Intelligent Systems and Int. Symp. on Advanced Intelligent Systems (SCIS&ISIS)*, pages 2035–2040, September 2006. Awarded “best paper of session”.

- [37] T. Ogata, W.J. Christmas, J. Kittler, and S. Ishikawa. Improving human activity detection by combining multi-dimensional motion descriptors with boosting. In *Proc 13th Intl. Conf. on Patt. Rec.*, volume 1, pages 295–298, 2006.
- [38] F. Yan, W.J. Christmas, and J. Kittler. A maximum a posteriori probability viterbi data association algorithm for ball tracking in sports video. In *Proc 13th Intl. Conf. on Patt. Rec.*, volume 1, pages 279–282, 2006.
- [39] F. Yan, A. Kostin, W.J. Christmas, and J. Kittler. A novel data association algorithm for object tracking in clutter with application to tennis video analysis. In *IEEE Computer Society Conference on Computer Vision and Pattern Recognition*, volume 1, pages 634–641, 2006.
- [40] Myung-Cheol Roh, William Christmas, Josef Kittler, and Seong-Whan Lee. Robust player gesture spotting and recognition in low-resolution sports video. In Axel Pinz Aleš Leonardis, Horst Bischof, editor, *Proceedings of the 9th European Conference on Computer Vision*, volume 4, pages 347–358, 2006.
- [41] Myung-Cheol Roh, William Christmas, Seong-Whan Lee, and Josef Kittler. Gesture spotting in low-quality video with features based on curvature scale space. In *Proceedings of the 7th international conference on automatic face and gesture recognition*, pages 375–380, 2006.
- [42] C. Hory, A. Kokaram, and W.J. Christmas. Threshold learning from samples drawn from the null hypothesis for the generalized likelihood ratio CUSUM test. In *Proceedings of the IEEE Workshop on Machine Learning for Signal Processing (MLSP)*, pages 111–116, 2005.
- [43] F. Yan, W. Christmas, and J. Kittler. A tennis ball tracking algorithm for automatic annotation of tennis match. In *Proc. British Machine Vision Conference 2005*, volume 2, pages 619–628, 2005.
- [44] W.J. Christmas, A. Kostin, F. Yan, I. Kolonias, and J. Kittler. A system for the automatic annotation of tennis matches. In *Fourth International Workshop on Content-Based Multimedia Indexing*, Riga, June 2005. Invited paper. pdf.
- [45] J. Kittler, W.J. Christmas, A. Kostin, F. Yan, I. Kolonias, and D. Windridge. A memory architecture and contextual reasoning framework for cognitive vision. In Heikki Kalviainen, Jussi Parkkinen, and Arto Kaarna, editors, *Image Analysis: 14th Scandinavian Conference*, volume 3540 of *Lecture Notes in Computer Science*, page 343, Joensuu, Finland, June 2005. Invited paper.
- [46] Ilias Kolonias, William Christmas, and Josef Kittler. Automatic evolution tracking for tennis matches using an HMM-based architecture. In *Proceedings of the IEEE Machine Learning for Signal Processing Workshop 2004*, pages 615–624, Sao Lus, Brazil, September 2004.
- [47] F. Cheng, W.J. Christmas, and J. Kittler. Periodic human motion description for sports video databases. In *Proceedings of the International Conference on Pattern Recognition*, August 2004.

- [48] E. Jaser, W. Christmas, and J. Kittler. Temporal post-processing of decision tree outputs for sports video categorisation. In A. Fred, T. Caelli, R. P.W. Duin, A. Campilho, and D. Ridder, editors, *Proceedings of the Joint IAPR International Workshops on Structural, Syntactic, and Statistical Pattern Recognition*, volume 3138 of *Lecture Notes in Computer Science*, pages 495–503. Springer-Verlag, August 2004.
- [49] Ilias Kolonias, William Christmas, and Josef Kittler. Tracking the evolution of a tennis match using hidden Markov models. In A. Fred, T. Caelli, R. P.W. Duin, A. Campilho, and D. Ridder, editors, *Proceedings of the Joint IAPR International Workshops on Structural, Syntactic, and Statistical Pattern Recognition*, volume 3138 of *Lecture Notes in Computer Science*, pages 1078–1086. Springer-Verlag, August 2004. pdf.
- [50] Ilias Kolonias, William Christmas, and Josef Kittler. Use of context in automatic annotation of sports videos. In *Progress in Pattern Recognition, Image Analysis and Applications: 9th Iberoamerican Congress on Pattern Recognition*, volume 3287, pages 1–12, October 2004. Invited paper at CIARP04. pdf.
- [51] Nicolas Gorges, Marc Hanheide, William Christmas, Christian Bauckhage, Gerhard Sagerer, and Joseph Kittler. Mosaics from arbitrary stereo video sequences. In *Proc. 26th Pattern Recognition Symposium*. German Association for Pattern Recognition (DAGM), August 2004.
- [52] Edward Jaser, Josef Kittler, and William Christmas. Hierarchical decision making scheme for sports video categorisation with temporal post-processing. In *Proceedings of IEEE Computer Society Conference on Computer Vision and Pattern Recognition (CVPR 2004)*, pages 908–913, June 2004.
- [53] E. Jaser, J. Kittler, and W. Christmas. Building classifier ensembles for automatic sports classification. In Roli F Windeatt T, editor, *Proceedings of the 4th International Workshop on Multiple Classifier Systems (MCS 2003)*, volume 2709 of *Lecture Notes in Computer Science*, pages 366–374. Springer-Verlag, June 2003.
- [54] William Christmas, Edward Jaser, Kieron Messer, and Josef Kittler. A multimedia system architecture for automatic annotation of sports videos. In J.L. Crowley et al., editor, *Computer vision systems: Third International Conference on Computer Vision systems*, volume 2626 of *LNCS*, pages 513 – 522. Springer, 2003. pdf.
- [55] A.J. Fitch, A. Kadyrov, W.J. Christmas, and J. Kittler. Orientation correlation. In P.L. Rosin and D. Marshall, editors, *British Machine Vision Conference*, volume 1, pages 133–142, 2002. Received the “Work that best deserves help with exploitation” award.
- [56] J. Kittler, M. Ballette, W.J. Christmas, E. Jaser, and K. Messer. Fusion of multiple cue detectors for automatic sports video annotation. In *Proceedings of workshop on Structural, Syntactic and Statistical Pattern Recognition*, pages 597–606, September 2002.
- [57] Kieron Messer, William Christmas, and Josef Kittler. Automatic sports classification. In *Proceedings of ICPR 2002*, volume II, pages 1005–1008, September 2002.
- [58] A.J. Fitch, A. Kadyrov, W.J. Christmas, and J. Kittler. Fast exhaustive robust matching. In *Proceedings of ICPR 2002*, volume III, pages 903–906, September 2002.

- [59] F. Cheng, W.J. Christmas, and J. Kittler. Recognising human running behaviour in sports video sequences. In *Proceedings of ICPR 2002*, volume II, pages 1017–1020, September 2002.
- [60] F. Cheng, W.J. Christmas, and J. Kittler. Detection and description of human running behaviour in sports video multimedia database. In *11th International Conference on Image Analysis and Processing*, pages 366–371, September 2001.
- [61] R. Rambaruth, W. Christmas, and J. Kittler. Motion segmentation and tracking using a 3-dimensional Markov Random Field. In *Proceedings of 3rd International Symposium on Video Processing and Multimedia Communications*, pages 53–59, Zadar, Croatia, June 2001.
- [62] J Kittler, K Messer, W J Christmas, B Levienaise-Obadia, and D Koubaroulis. Generation of semantic cues for sports video annotation. In *Proceedings IEEE International Conference on Image Processing*, pages 26–29, 2001.
- [63] W. Christmas, J. Kittler, D. Koubaroulis, B. Levienaise-Obadia, and K. Messer. Generation of semantic cues for sports video annotation. In *International Workshop on Information Retrieval, Oulu, Finland*, pages 171–178, September 2001.
- [64] F. Cheng, W.J. Christmas, and J. Kittler. Extracting a feature of human running behaviour in sports video sequences. In *International Workshop on Information Retrieval*, pages 161–170, September 2001.
- [65] M. Pandit, W.J. Christmas, and J. Kittler. Audio classification for annotation of sports videos. In *International Workshop on Information Retrieval*, page ??, September 2001.
- [66] J Kittler, Y Yusoff, W J Christmas, T Windeatt, and D Windridge. Boosting multiple experts by joint optimization of decision thresholds. *Pattern Recognition and Image Analysis*, 11(3):529–541, 2001.
- [67] R. Rambaruth, W.J. Christmas, and J. Kittler. Representation of regions for accurate motion compensation. In *Proceedings of 10th European Signal Processing Conference*, volume 2, pages 1185–8, Tampere, Finland, September 2000. Tampere Univ. Technology.
- [68] B.V. Levienaise-Obadia, J. Kittler, and W. Christmas. Defining quantisation strategies and a perceptual similarity measure for texture-based annotation and retrieval. In *Proceedings of ICPR 2000*, Barcelona (Spain), September 2000.
- [69] Y. Yusoff, J. Kittler, and W. Christmas. Video shot cut detection using adaptive thresholding. In M. Mirmehdi and Barry Thomas, editors, *Proceedings of the 11th British Machine Vision Conference*, volume 1, pages 362–371. BMVA, September 2000. Paper presented by W. Christmas.
- [70] B.V. Levienaise-Obadia, W. Christmas, J. Kittler, K. Messer, and Y. Yusoff. OVID: towards Object-based VIDEO retrieval. In Bouman CA Yeung MM, Yeo BL, editor, *Proceedings of Storage and Retrieval for Video and Image Databases VIII*, volume 3972 of *SPIE/IT&T Symposium: Electronic Imaging'2000*, pages 532–543, San Jose (USA), January 2000.

- [71] M. Pandit, Y. Yusoff, W.J. Christmas, and E.H.S. Chilton. Video assisted segmentation of speech and audio track. In *Multimedia Storage and Archiving Systems IV, Proceedings of SPIE*, pages 68–77, September 1999.
- [72] Y. Yusoff, J. Kittler, and W. Christmas. Combining multiple experts for classifying shot changes in video sequences. In *Proceedings of the 6th International Conference on Multimedia Computing and Systems*, June 1999.
- [73] B. Levienaise-Obadia, J. Kittler, and W. Christmas. Comparative study of strategies for illumination-invariant texture representations. In SPIE, editor, *Proc. Storage and Retrieval for Video and Image Databases VII*, 1999.
- [74] W.J. Christmas. Spatial filtering requirements for gradient-based optical flow measurement. In P.H. Lewis and M.S. Nixon, editors, *Proceedings of the Ninth British Machine Vision Conference*, volume 1, pages 185–194, Southampton, U.K, September 1998.
- [75] Y. Yusoff, W. Christmas, and J. Kittler. A study on automatic shot change detection. In D. Hutchison and Ralf Schafer, editors, *Proceedings Third European Conference on Multimedia Applications, Services and Techniques (ECMAST)*, number 1425 in LNCS, pages 177–189. Springer, May 1998. pdf.
- [76] R. Bartl, M. Petrou, W.J. Christmas, and P.L. Palmer. On the automatic registration of cadastral maps and Landsat TM images. In *Satellite Remote Sensing Symposium, Image and Signal Processing*, volume SPIE 2955, pages 9–20, 1996.
- [77] W.J. Christmas, J. Kittler, and M. Petrou. Error propagation for 2D-to-3D matching with application to underwater navigation. In R.B. Fisher and E. Trucco, editors, *Proceedings of the Seventh British Machine Vision Conference*, volume 2, pages 555–564, Edinburgh, U.K, September 1996.
- [78] W.J. Christmas, J. Kittler, and M. Petrou. Exploiting temporal context in vision-based navigation. In J.G. Verly and S.S. Welch, editors, *Enhanced and Synthetic Vision*, volume SPIE 2736, pages 169–179, Orlando, Florida, USA, 1996.
- [79] W.J. Christmas, J. Kittler, and M. Petrou. Modelling compatibility coefficient distributions for probabilistic feature-labelling schemes. In D. Pycock, editor, *Proceedings of the Sixth British Machine Vision Conference*, volume 2, pages 603–612, Birmingham, U.K, September 1995.
- [80] W.J. Christmas, J. Kittler, and M. Petrou. Non-iterative contextual correspondence matching. In J-O. Eklundh, editor, *Computer Vision – ECCV’94*, volume II, pages 137–142, Stockholm, Sweden, 1994. Springer-Verlag.
- [81] W.J. Christmas, J. Kittler, and M. Petrou. Analytical approaches to the neural net architecture design. In *Pattern Recognition in Practice IV*, Vlieland, The Netherlands, 1994.
- [82] W.J. Christmas, J. Kittler, and M. Petrou. Location of objects in a cluttered scene using probabilistic relaxation. In *2nd International Workshop on Visual Form*, Capri, Italy, 1994.

- [83] M. Petrou, P.L. Palmer, W.J. Christmas, and J. Kittler. Robust skeletonization and object recognition from grey images. In *2nd International Workshop on Visual Form*, Capri, Italy, 1994.
- [84] W.J. Christmas, J. Kittler, and M. Petrou. Matching of road segments using probabilistic relaxation: reducing the computational requirements. In J.G. Verly and S.S. Welch, editors, *Sensing, Imaging and Vision for control and guidance of aerospace vehicles*, volume SPIE 2220, pages 169–179, Orlando, Florida, USA, 1994.
- [85] W.J. Christmas, J. Kittler, and M. Petrou. Matching of road segments using probabilistic relaxation: a hierarchical approach. In S-S. Chen, editor, *Neural and Stochastic Methods in Image and Signal Processing III*, volume SPIE 2304, pages 166–174, San Diego, California, USA, 1994.
- [86] J. Kittler, W.J. Christmas, and M. Petrou. Probabilistic relaxation for matching problems in computer vision. In *Proceedings of the Fourth International Conference on Computer Vision*, pages 666–673, Berlin, Germany, 1993.
- [87] J. Kittler, W.J. Christmas, and M. Petrou. Probabilistic relaxation for matching of symbolic structures. In *Workshop on Structural and Syntactic Pattern Recognition*, pages 471–480, Bern, Switzerland, 1992.
- [88] W.J. Christmas. A microprocessor-based digital audio coder and decoder. In *Proceedings of the IERE International Conference on Digital Processing of Signals in Communications*, Loughborough, UK, 1985.

Other publications

- [1] Josef Kittler, Patrik Huber, Zhen-Hua Feng, Guosheng Hu, and William Christmas. *Articulated Motion and Deformable Objects*, volume 9756 of *LNCS*, chapter 3D Morphable Face Models and Their Applications, pages 185–206. Springer, 2016.
- [2] Thomas Moeslund, Graham Thomas, and Adrian Hilton, editors. *Computer Vision in Sports: Ball Tracking for Tennis Video Annotation*, chapter 2. *Advances in Computer Vision and Pattern Recognition*. Springer, 2014. [more info](#).
- [3] Fangxiang Cheng, William J. Christmas, and Josef Kittler. A non-rigid foreground object detection algorithm for the application of sports video annotation and retrieval. Technical Report VSSP-TR-1/2002, Centre for Vision, Speech and Signal Processing, University of Surrey, UK, 2002.
- [4] W.J. Christmas. *Structural matching in computer vision using probabilistic reasoning*. PhD thesis, Centre for Vision, Speech and Signal Processing, University of Surrey, UK, 1995. [pdf](#).
- [5] W.J. Christmas. Real-time image enhancement for subsea inspection. Master’s thesis, Centre for Vision, Speech and Signal Processing, University of Surrey, UK, 1991.
- [6] W.J. Christmas. A method for measuring echoes in the multipath propagation of v.h.f. signals. Technical Report BBC RD 1978/1, British Broadcasting Corporation Research

Department, 1978. (A paper on theoretical aspects of this Report was presented at an IEE Colloquium in 1977).