

Richard Prager's Publications

Refereed Journal Articles

- [J1] L. Chen, S. J. Freeman, A. H. Gee, R. J. Housden, R. W. Prager, R. Sinnatamby, and G. M. Treece. Initial clinical experience of an ultrasonic strain imaging system with novel noise masking capability. *British Journal of Radiology*, 83:702–706, August 2010.
- [J2] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A hybrid displacement estimation method for ultrasonic elasticity imaging. *IEEE Transactions in Ultrasonics, Ferroelectrics, and Frequency Control*, 57(4), April 2010.
- [J3] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A normalization method for axial-shear strain elastography. *IEEE Transactions in Ultrasonics, Ferroelectrics, and Frequency Control (to appear)*, 2010.
- [J4] R. J. Housden, A. H. Gee, R. W. Prager, and G. M. Treece. 3D ultrasonic strain imaging using freehand scanning and a mechanically-swept probe. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control (to appear)*, 2010.
- [J5] U. Z. Ijaz, R. W. Prager, A. H. Gee, and G. M. Treece. Optimization strategies for ultrasound volume registration. *Measurement Science and Technology*, 21(8):085803, August 2010. Doi:10.1088/0957-0233/21/8/085803.
- [J6] H.-C. Shin, R. W. Prager, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Estimation of average speed of sound using deconvolution of medical ultrasound data. *Ultrasound in Medicine and Biology*, 36(4):623–636, April 2010.
- [J7] H.-C. Shin, R. W. Prager, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Estimation of speed of sound in dual-layered media using medical ultrasound image deconvolution. *Ultrasonics*, 50:716–725, June 2010.
- [J8] L. Chen, G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. A quality-guided displacement tracking algorithm for ultrasonic elasticity imaging. *Medical Image Analysis*, 13(2):286–296, April 2009.
- [J9] E. J. Harris, R. Symonds-Taylor, G. M. Treece, A. H. Gee, R. W. Prager, P. Brabants, and P. M. Evans. Evaluation of a three-dimensional ultrasound localisation system incorporating probe pressure correction for use in partial breast irradiation. *British Journal of Radiology*, 82(982):839–846, October 2009.
- [J10] H.-C. Shin, R. W. Prager, J. K. H. Ng, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Sensitivity to point-spread function parameters in medical ultrasound image deconvolution. *Ultrasonics*, 49:344–357, 2009.
- [J11] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Uniform precision ultrasound strain imaging. *IEEE Transactions in Ultrasonics, Ferroelectrics, and Frequency Control*, 56(11):2420–3010, November 2009.
- [J12] R. Housden, A. Gee, R. Prager, and G. Treece. Rotational motion in sensorless freehand three-dimensional ultrasound. *Ultrasonics*, 48(5):412–422, Sept 2008.
- [J13] R. Housden, G. Treece, A. Gee, and R. Prager. Calibration of an orientation sensor for freehand 3D ultrasound and its use in a hybrid acquisition system. *Biomedical Engineering Online*, 7(5), January 2008. doi:10.1186/1475-925X-7-5.
- [J14] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Real-time freehand 3D ultrasound calibration. *Ultrasound in Medicine and Biology*, 34(2):239–251, February 2008.
- [J15] P. W. Hsu, G. M. Treece, R. W. Prager, N. E. Houghton, and A. H. Gee. Comparison of freehand 3-D ultrasound calibration techniques using a stylus. *Ultrasound in Medicine and Biology*, 34(10):1610–1621, October 2008.
- [J16] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Dynamic resolution selection in ultrasonic strain imaging. *Ultrasound in Medicine and Biology*, 34(5):809–823, 2008.

- [J17] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. The general properties including accuracy and resolution of linear-filtering methods for strain estimation. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, 55(11):2363–2368, November 2008.
- [J18] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. An intelligent interface for freehand strain imaging. *Ultrasound in Medicine and Biology*, 34(7):1117–1128, July 2008.
- [J19] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Phase-based ultrasonic deformation estimation. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, 55(1):94–111, January 2008.
- [J20] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Freehand ultrasound elastography with a 3D probe. *Ultrasound in Medicine and Biology*, 34(3):463–474, March 2008. doi:10.1016/j.ultrasmedbio.2007.08.014.
- [J21] C. J. C. Cash, C. E. Coles, G. M. Treece, A. D. Purushotham, P. Britton, R. Sinnatamby, A. H. Gee, and R. W. Prager. Breast cancers: noninvasive method of preoperative localization with three-dimensional US and surface contour mapping. *Radiology*, 245(2):556–566, November 2007. <http://dx.doi.org/10.1148/radiol.2452060906>.
- [J22] C. E. Coles, C. J. C. Cash, G. M. Treece, F. N. A. C. Miller, A. C. F. Hoole, A. H. Gee, R. W. Prager, R. Sinnatamby, P. Britton, J. S. Wilkinson, A. D. Purushotham, and N. G. Burnet. High definition three-dimensional ultrasound to localise the tumour bed: a breast radiotherapy planning study. *Radiotherapy and Oncology*, 84(3):233–241, September 2007.
- [J23] R. Housden, A. Gee, G. Treece, and R. Prager. Sensorless reconstruction of unconstrained freehand 3D ultrasound data. *Ultrasound in Medicine and Biology*, 33(3):408–419, March 2007.
- [J24] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Estimation of displacement location for enhanced strain imaging. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, 54(9):1751–1771, September 2007.
- [J25] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Wavelet restoration of medical pulse-echo ultrasound images in an EM framework. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 54(3):550–568, March 2007.
- [J26] G. M. Treece, A. H. Gee, and R. W. Prager. Ultrasound compounding with automatic attenuation compensation using paired angle scans. *Ultrasound in Medicine and Biology*, 33(4):630–642, April 2007.
- [J27] A. H. Gee, R. J. Housden, P. Hassenpflug, G. M. Treece, and R. W. Prager. Sensorless freehand 3D ultrasound in real tissue: speckle decorrelation without fully developed speckle. *Medical Image Analysis*, 10(2):137–149, April 2006.
- [J28] R. J. Housden, A. H. Gee, G. M. Treece, and R. W. Prager. Subsample interpolation strategies for sensorless freehand 3D ultrasound. *Ultrasound in Medicine and Biology*, 32(12):1897–1904, December 2006.
- [J29] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Rapid, easy and reliable calibration for freehand 3D ultrasound. *Ultrasound in Medicine and Biology*, 32(6):823–835, June 2006.
- [J30] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. 3D elastography using freehand ultrasound. *Ultrasound in Medicine and Biology*, 32(4):529–545, April 2006.
- [J31] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Modelling ultrasound imaging as a linear shift-variant system. *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 53(3):549–563, 2006.
- [J32] C. Cash, A. Sardesai, L. Berman, G. Herrick, G. Treece, R. Prager, and A. Gee. Spatial mapping of the brachial plexus using three-dimensional ultrasound. *The British Journal of Radiology*, 78(936):1086–1094, Dec 2005.
- [J33] C. J. C. Cash, G. M. Treece, L. H. Berman, A. H. Gee, and R. W. Prager. 3D reconstruction of the skeletal anatomy of the normal neonatal foot using 3D ultrasound. *The British Journal of Radiology*, 78(931):587–595, July 2005.
- [J34] A. H. Gee, N. E. Houghton, G. M. Treece, and R. W. Prager. A mechanical instrument for 3D ultrasound probe calibration. *Ultrasound in Medicine and Biology*, 31(4):505–518, April 2005.

- [J35] P. Hassenpflug, R. W. Prager, G. M. Treece, and A. H. Gee. Speckle classification for sensorless freehand 3D ultrasound. *Ultrasound in Medicine and Biology*, 31(11):1499–1508, November 2005.
- [J36] G. M. Treece, A. H. Gee, and R. W. Prager. Erratum due to production error for: RF and amplitude-based probe pressure correction for 3D ultrasound. *Ultrasound in Medicine and Biology*, 31(6):871–874, June 2005.
- [J37] G. M. Treece, A. H. Gee, and R. W. Prager. RF and amplitude-based probe pressure correction for 3D ultrasound. *Ultrasound in Medicine and Biology*, 31(4):493–503, April 2005.
- [J38] G. M. Treece, R. W. Prager, and A. H. Gee. Ultrasound attenuation measurement in the presence of scatterer variation for reduction of shadowing and enhancement. *IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control*, 52(12):2346–2360, December 2005.
- [J39] C. J. C. Cash, L. H. Berman, G. M. Treece, A. H. Gee, and R. W. Prager. Two- and three-dimensional ultrasound in the development of a needle-free injection system. *The British Journal of Radiology*, 77:236–242, March 2004.
- [J40] A. H. Gee, G. M. Treece, R. W. Prager, C. J. C. Cash, and L. H. Berman. Rapid registration for wide field-of-view freehand three-dimensional ultrasound. *IEEE Transactions on Medical Imaging*, 22(11):1344–1357, 2003.
- [J41] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Decompression and speckle detection for ultrasound images using a homodyned k-distribution. *Pattern Recognition Letters*, 24(4–5):705–713, 2003.
- [J42] R. W. Prager, A. H. Gee, G. M. Treece, C. J. C. Cash, and L. H. Berman. Sensorless freehand 3D ultrasound using regression of the echo intensity. *Ultrasound in Medicine and Biology*, 29(3):437–446, March 2003.
- [J43] G. M. Treece, A. H. Gee, R. W. Prager, C. J. C. Cash, and L. H. Berman. High definition freehand 3D ultrasound. *Ultrasound in Medicine and Biology*, 29(4):529–546, April 2003.
- [J44] B. S. Carmo, R. W. Prager, A. H. Gee, and L. H. Berman. Speckle detection for 3D ultrasound. *Ultrasonics*, 40(1–8):129–132, May 2002.
- [J45] A. H. Gee, R. W. Prager, G. M. Treece, and L. H. Berman. Narrow-band volume rendering for freehand 3D ultrasound. *Computers and Graphics*, 26(3):463–476, 2002.
- [J46] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Analysis of speckle in ultrasound images using fractional-order statistics of the homodyned k-distribution. *Ultrasonics*, 40(1–8):133–137, May 2002.
- [J47] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Freehand 3D ultrasound without voxels: volume measurement and visualisation using the stradx system. *Ultrasonics*, 40(1–8):109–115, May 2002.
- [J48] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Correction of probe pressure artifacts in freehand 3D ultrasound. *Medical Image Analysis*, 6(3):199–215, September 2002.
- [J49] R. J. A. Lapeer and R. W. Prager. Fetal head moulding: finite element analysis of a fetal skull subjected to uterine pressures during the first stage of labour. *Journal of Biomechanics*, 34(9):1125–1133, September 2001.
- [J50] G. M. Treece, R. W. Prager, and A. H. Gee. Volume-based three-dimensional metamorphosis using automatic region correspondence. *The Visual Computer*, 17(7):397–414, 2001.
- [J51] G. M. Treece, R. W. Prager, A. H. Gee, and L. Berman. 3D ultrasound measurement of large organ volume. *Medical Image Analysis*, 5(1):41–54, March 2001.
- [J52] R. J. A. Lapeer and R. W. Prager. 3D shape recovery of a newborn skull using thin-plane splines. *Computerized Medical Imaging and Graphics*, 24(3):193–204, 2000.
- [J53] D. G. Melvin, M. Niranjana, R. W. Prager, A. K. Trull, and V. F. Hughes. Neuro-computing versus linear statistical techniques applied to liver transplant monitoring: a comparative study. *IEEE Transactions on Biomedical Engineering*, 47(8):1036–1043, August 2000.
- [J54] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Surface interpolation from sparse cross-sections using region correspondence. *IEEE Transactions on Medical Imaging*, 19(11), November 2000.

- [J55] P. M. Tuomola, A. H. Gee, R. W. Prager, and L. Berman. Body-centered visualisation for freehand 3D ultrasound. *Ultrasound in Medicine and Biology*, 26(4):539–550, May 2000.
- [J56] R. W. Prager, A. H. Gee, and L. Berman. Stradx: real-time acquisition and visualisation of freehand three-dimensional ultrasound. *Medical Image Analysis*, 3(2):129–140, 1999.
- [J57] G. M. Treece, R. W. Prager, and A. H. Gee. Regularised marching tetrahedra: improved iso-surface extraction. *Computers and Graphics*, 23(4):583–598, 1999.
- [J58] G. M. Treece, R. W. Prager, A. H. Gee, and L. Berman. Fast surface and volume estimation from non-parallel cross-sections, for freehand 3-D ultrasound. *Medical Image Analysis*, 3(2):141–173, 1999.
- [J59] D. R. Lovell, C. R. Dance, M. Niranjani, R. W. Prager, K. J. Dalton, and R. Derom. Feature selection using expected attainable discrimination. *Pattern Recognition Letters*, 19(5-6):393–401, 1998.
- [J60] D. R. Lovell, B. Rosario, M. Niranjani, R. W. Prager, K. J. Dalton, R. Derom, and J. Chalmers. The QAMC project: A case study of neural networks for medical risk prediction. *Australian Journal of Intelligent Information Processing Systems*, 5(1):24–28, Autumn 1998.
- [J61] R. W. Prager, R. N. Rohling, A. H. Gee, and L. Berman. Rapid calibration for 3-D freehand ultrasound. *Ultrasound in Medicine and Biology*, 24(6):855–869, 1998.
- [J62] D. R. Lovell, B. Rosario, M. Niranjani, R. W. Prager, K. J. Dalton, R. Derom, and J. Chalmers. Design, construction and evaluation of systems to predict risk in obstetrics. *International Journal of Medical Informatics*, 46(3):159–173, 1997.
- [J63] M. H. Syn, R. W. Prager, and L. H. Berman. Bayesian registration of models using finite element eigenmodes. *International Journal of Medical Informatics*, 45:145–162, 1997.
- [J64] G. F. Harpur and R. W. Prager. Development of low entropy coding in a recurrent network. *Network: Computation in Neural Systems*, 7(2):277–284, 1996.
- [J65] A. H. Gee and R. W. Prager. Limitations of neural networks for solving traveling salesman problems. *IEEE Transactions on Neural Networks*, 6(1):280–282, January 1995.
- [J66] R. J. A. Lapeer, K. J. Dalton, R. W. Prager, J. J. Forsström, H. K. Selbmann, and D. R. Application of neural networks to the ranking of perinatal variables influencing birthweight. *The Scandinavian Journal of Clinical & Laboratory Investigation*, 55(222):83–93, 1995.
- [J67] A. H. Gee and R. W. Prager. Polyhedral combinatorics and neural networks. *Neural Computation*, 6(1):161–180, January 1994.
- [J68] A. H. Gee, S. V. B. Aiyer, and R. W. Prager. An analytical framework for optimizing neural networks. *Neural Networks*, 6(1):79–97, 1993.
- [J69] G. E. Robbins, M. D. Plumbley, J. C. Hughes, F. Fallside, and R. W. Prager. Generation and adaptation of neural networks by evolutionary techniques (GANNET). *Neural Computing and Applications*, 1:23–31, 1993.
- [J70] M. W. H. Chong, F. Fallside, T. P. Marsland, and R. W. Prager. Blade runner: A real-time speech recogniser. *Concurrency: Practice & Experience*, 3(3):145–157, June 1991.
- [J71] T. J. W. Clarke, R. W. Prager, and F. Fallside. The modified Kanerva model: theory and results for real time word recognition. *Proceedings of the IEE: Section F*, 138:25–31, 1991.
- [J72] R. W. Prager and F. Fallside. The modified Kanerva model for automatic speech recognition. *Computer Speech and Language*, 3:61–81, 1988.
- [J73] J. J. Modi and R. W. Prager. Implementation of bubble sort and the odd-even transposition sort on a rack of transputers. *Parallel Computing*, 4(3):345–348, 1987.
- [J74] R. W. Prager and F. Fallside. A comparison of the Boltzmann machine and the back propagation network as recognizers of static speech patterns. *Computer Speech and Language*, 2:127–183, 1987.
- [J75] R. W. Prager, T. D. Harrison, and F. Fallside. Boltzmann machines for speech recognition. *Computer Speech and Language*, 1:3–27, 1986.

Invited Journal Articles

- [I1] R. W. Prager, U. Z. Ijaz, A. H. Gee, and G. M. Treece. Three-dimensional ultrasound imaging. *Proc. IMechE, Part H: Journal of Engineering in Medicine*, 224(H2):193–223, 2010. DOI: 10.1243/09544119JEIM586.
- [I2] A. H. Gee, J. E. Lindop, G. M. Treece, R. W. Prager, and S. Freeman. Stable, intelligible ultrasonic strain imaging. *Ultrasound*, 16(4):187–192, November 2008.
- [I3] A. H. Gee, R. W. Prager, G. M. Treece, C. J. C. Cash, and L. H. Berman. Processing and visualising three-dimensional ultrasound data. *British Journal of Radiology*, 77(S2):S186–S193, December 2004.
- [I4] A. H. Gee, R. W. Prager, G. M. Treece, and L. H. Berman. Engineering a freehand 3D ultrasound system. *Pattern Recognition Letters*, 24(4–5):757–777, 2003.

Refereed Conference Papers

- [C1] R. W. Prager, H. H. Wong, H. Gomersall, A. H. Gee, and G. M. Treece. Using graphics processors for three-dimensional ultrasound deconvolution. In *Proceedings Medical Physics and Engineering Conference 2010*, page 71. Institute of Physics and Engineering in Medicine, Nottingham, UK, September 2010.
- [C2] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. Development of a weighting scheme for strain estimation. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 35. Vlissingen, The Netherlands, September 2009.
- [C3] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A hybrid displacement estimation method for strain imaging. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 66. Vlissingen, The Netherlands, September 2009.
- [C4] A. H. Gee, G. M. Treece, L. Chen, and R. W. Prager. The use of quality metrics in ultrasonic strain imaging. In *Proceedings of Acoustical Imaging 30 (to appear)*. Monterey, California, March 2009.
- [C5] R. J. Housden, A. H. Gee, G. M. Treece, and R. W. Prager. Freehand strain image normalization for convex probes. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 87. Vlissingen, The Netherlands, September 2009.
- [C6] U. Z. Ijaz, R. W. Prager, A. H. Gee, and G. M. Treece. Particle swarm optimization for in vivo 3D ultrasound volume registration. In *Proceedings of Acoustical Imaging 30 (to appear)*. Monterey, California, March 2009.
- [C7] U. Z. Ijaz, R. W. Prager, A. H. Gee, and G. M. Treece. A study of similarity measures for in vivo 3D ultrasound volume registration. In *Proceedings of Acoustical Imaging 30 (to appear)*. Monterey, California, March 2009.
- [C8] L. Chen, G. M. Treece, J. Lindop, A. H. Gee, and R. W. Prager. A multi-directional displacement tracking algorithm for strain imaging. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 60. Austin, Texas, October 2008.
- [C9] A. H. Gee, L. Chen, S. Freeman, G. M. Treece, R. W. Prager, and L. Berman. A clinical database for evaluating freehand quasistatic strain imaging systems. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 25. Austin, Texas, October 2008.
- [C10] R. J. Housden, A. H. Gee, G. M. Treece, R. W. Prager, G. Berry, L. Garcia, and J. C. Bamber. A comparison of 3D strain image quality using freehand 3d imaging and a mechanically-swept 3d probe. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 53. Austin, Texas, October 2008.
- [C11] G. M. Treece, J. Lindop, A. H. Gee, and R. W. Prager. Fast variable smoothing of strain data using non-parametric regression. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 57. Austin, Texas, October 2008.
- [C12] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Real-time freehand 3D ultrasound calibration. In S. Y. Emelianov and S. A. McAleavey, editors, *Proceedings of SPIE Medical Imaging: ultrasonic imaging and signal processing*, volume 6513. San Diego, California, February 2007. Doi:10.1117/12.708115.

- [C13] P. W. Hsu, R. W. Prager, N. E. Houghton, A. H. Gee, and G. M. Treece. Accurate fiducial location for freehand 3D ultrasound. In S. Y. Emelianov and S. A. McAleavey, editors, *Proceedings of SPIE Medical Imaging: ultrasonic imaging and signal processing*, volume 6513. San Diego, California, February 2007. Doi:10.1117/12.708334.
- [C14] J. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Compounding and display of pseudo-strain data. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 29. Santa Fe, New Mexico, November 2007.
- [C15] J. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Strain estimation by non-parametric surface regression. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 33. Santa Fe, New Mexico, November 2007.
- [C16] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Dynamic resolution selection in strain imaging. In I. Akiyama, editor, *Acoustical Imaging Volume 29: Proceedings of the 29th International Symposium on Acoustical Imaging*, pages 33–38. Springer, Shonan, Japan, April 2007. ISBN:978-1-4020-8822-3.
- [C17] J. K. H. Ng, W. H. Gomersall, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Wavelet restoration of three-dimensional medical pulse-echo ultrasound datasets in an EM framework. In I. Akiyama, editor, *Acoustical Imaging Volume 29: Proceedings of the 29th International Symposium on Acoustical Imaging*, pages 403–408. Springer, Shonan, Japan, April 2007. ISBN:978-1-4020-8822-3.
- [C18] G. M. Treece, J. Lindop, A. H. Gee, and R. W. Prager. Freehand strain imaging with a 3D probe. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 66. Santa Fe, New Mexico, November 2007.
- [C19] G. M. Treece, J. Lindop, A. H. Gee, and R. W. Prager. Normalisation in freehand strain imaging. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 27. Santa Fe, New Mexico, November 2007.
- [C20] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Near-real-time 3D ultrasonic strain imaging. In I. Akiyama, editor, *Acoustical Imaging Volume 29: Proceedings of the 29th International Symposium on Acoustical Imaging*, pages 27–32. Springer, Shonan, Japan, April 2007. ISBN:978-1-4020-8822-3.
- [C21] R. Housden, A. Gee, G. Treece, and R. Prager. Sensorless reconstruction of freehand 3D ultrasound data. In *Medical Image Computing and Computer-Assisted Intervention — MICCAI’06*, pages 356–363. Copenhagen, Denmark, October 2006. LNCS 4191, Springer.
- [C22] J. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Location estimation increases the accuracy of ultrasonic strain estimates. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 104. Snowbird, Utah, October 2006.
- [C23] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. An iterative, wavelet-based deconvolution algorithm for the restoration of ultrasound images in an EM framework. In S. Emelianov and W. F. Walker, editors, *Proceedings of SPIE Medical Imaging: ultrasonic imaging and signal processing*, volume 6147. San Diego, California, February 2006.
- [C24] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Efficient elimination of dropouts in displacement tracking. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 68. Snowbird, Utah, October 2006.
- [C25] P. Hassenpflug, R. W. Prager, G. M. Treece, and A. H. Gee. Speckle classification for sensorless freehand 3D ultrasound. In *Medical Image Understanding and Analysis*, pages 119–122. Bristol, July 2005.
- [C26] R. J. Housden, A. H. Gee, R. W. Prager, and G. M. Treece. Sensorless freehand 3D ultrasound for non-monotonic and intersecting frames. In *Medical Image Understanding and Analysis*, pages 127–130. Bristol, July 2005.
- [C27] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Rapid, easy and reliable calibration for freehand 3D ultrasound. In *Medical Image Understanding and Analysis*, pages 91–94. Bristol, July 2005.
- [C28] J. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Frame filtering for improved freehand 3D elastography. In *Ultrasonic Measurement and Imaging of Tissue Elasticity*, page 74. Austin, Texas, October 2005.

- [C29] A. Marianski, R. W. Prager, A. H. Gee, and G. M. Treece. Ultrasound point-spread function estimation using higher order statistics. In *Medical Image Understanding and Analysis*, pages 223–226. Bristol, July 2005.
- [C30] C. Cash, L. Berman, G. Treece, A. Gee, and R. Prager. Three-dimensional reconstructions of the normal and abnormal neonatal foot using high-resolution freehand 3D ultrasound. In *Proceedings of the Radiological Society of North America (RSNA 2004)*. Chicago, December 2004.
- [C31] C. Cash, A. Sardesai, L. Berman, G. Herrick, G. Treece, R. Prager, and A. Gee. Spatial mapping of the brachial plexus using high resolution three-dimensional ultrasound. In *Proceedings of the Radiological Society of North America (RSNA 2004)*. Chicago, December 2004.
- [C32] R. Chung, R. W. Prager, A. H. Gee, and G. M. Treece. High frequency image-based flow detection. *Journal of Physics: Conference Series*, 1:193–198, April 2004. Advanced Metrology for Ultrasound in Medicine.
- [C33] P. Hassenpflug, R. W. Prager, G. M. Treece, and A. H. Gee. Distance measurement for sensorless 3D ultrasound. In *Proceedings of Medical Image Computing and Computer-Assisted Intervention (MICCAI 2004) volume 2*, pages 1087–1188. Saint-Malo, France, September 2004. (LNCS 3217, Springer).
- [C34] J. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. 3D elastography using freehand ultrasound. In *Proceedings of Medical Image Computing and Computer-Assisted Intervention (MICCAI 2004) volume 2*, pages 1103–1104. Saint-Malo, France, September 2004. (LNCS 3217, Springer).
- [C35] G. M. Treece, R. W. Prager, and A. H. Gee. Freely available software for 3D RF ultrasound. In *Proceedings of Medical Image Computing and Computer-Assisted Intervention (MICCAI 2004) volume 2*, pages 1099–1100. Saint-Malo, France, September 2004. (LNCS 3217, Springer).
- [C36] R. W. Prager, A. H. Gee, G. M. Treece, C. J. C. Cash, and L. H. Berman. Using image-based regression to acquire freehand 3D ultrasound. In *Proceedings of the 2002 IEEE International Symposium on Biomedical Imaging*, pages 970–973. Washington DC, USA, July 2002.
- [C37] G. M. Treece, R. W. Prager, A. H. Gee, C. J. C. Cash, and L. H. Berman. Grey-scale gating for freehand 3D ultrasound. In *Proceedings of the 2002 IEEE International Symposium on Biomedical Imaging*, pages 993–996. Washington DC, USA, July 2002.
- [C38] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Correction of probe pressure artifacts in freehand 3D ultrasound. In *Proceedings of Medical Image Computing and Computer-Assisted Intervention (MICCAI 2001)*, pages 283–290. Utrecht, The Netherlands, October 2001. (LNCS 2208, Springer).
- [C39] J. C. C. Carr, M. M. Fynes, A. H. Gee, R. W. Prager, G. M. Treece, C. Overton, and L. H. Berman. Design of a clinical free-hand 3D ultrasound system. In *Medical Image Understanding and Analysis*, pages 15–18. London, July 2000.
- [C40] J. C. C. Carr, J. L. Stallkamp, M. M. Fynes, A. H. Gee, R. W. Prager, G. M. Treece, C. Overton, and L. H. Berman. Design of a clinical free-hand 3D ultrasound system. In *Proceedings of SPIE Vol. 3982, Medical Imaging 2000 (Ultrasonic Imaging and Signal Processing)*, pages 14–25. San Diego, California, February 2000.
- [C41] R. W. Prager, A. H. Gee, and L. H. Berman. Freehand 3D ultrasound without a position sensor. In *Medical Image Understanding and Analysis*, pages 19–22. London, July 2000.
- [C42] G. M. Treece, R. Prager, and A. H. Gee. Volume measurement of large organs with 3D ultrasound. In *Medical Image Understanding and Analysis*, pages 133–136. London, July 2000.
- [C43] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Volume measurement of large organs with 3D ultrasound. In *Proceedings of SPIE Vol. 3982, Medical Imaging 2000 (Ultrasonic Imaging and Signal Processing)*, pages 2–13. San Diego, California, February 2000.
- [C44] A. H. Gee, R. W. Prager, and L. Berman. Non-planar reslicing for freehand 3-D ultrasound. In *Proceedings of the 2nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 716–725. Cambridge, UK, September 1999. (LNCS 1679, Springer).
- [C45] A. H. Gee, R. W. Prager, and L. H. Berman. Non-planar reslicing for freehand 3D ultrasound. In *Medical Image Understanding and Analysis*, pages 13–16. Oxford, July 1999.

- [C46] R. J. A. Lapeer and R. W. Prager. Finite element model of a fetal skull subjected to labour forces. In *Proceedings of the 2nd International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 1143–1155. Cambridge, UK, September 1999. (LNCS 1679, Springer).
- [C47] R. W. Prager, A. H. Gee, M. Pearson, and L. H. Berman. Practical segmentation of 3D ultrasound. In *Medical Image Understanding and Analysis*, pages 161–164. Oxford, July 1999.
- [C48] G. M. Treece, R. Prager, and A. H. Gee. Surface interpolation for sparse cross-sections using region correspondence. In *Medical Image Understanding and Analysis*, pages 17–20. Oxford, July 1999.
- [C49] G. M. Treece, R. Prager, A. H. Gee, and L. H. Berman. Volume measurement in sequential freehand 3D ultrasound. In *Proceedings of the 16th International Conference in Information Processing in Medical Imaging*, pages 70–83. Visegrád, Hungary, June 1999. (LNCS 1613, Springer).
- [C50] J. C. C. Carr, W. R. Fright, A. H. Gee, R. W. Prager, and K. J. Dalton. 3D shape reconstruction using volumetric intersection techniques. In *International Conference on Computer Vision*, pages 1095–1100. Bombay, January 1998.
- [C51] J. C. C. Carr, A. H. Gee, R. W. Prager, and K. J. Dalton. Quantitative visualisation of surfaces from volumetric data. In *Proceedings of the Sixth International Conference in Central Europe on Computer Graphics and Visualization*, pages 57–64. Plzen, Czech Republic, February 1998.
- [C52] D. R. Lovell, B. Rosario, M. Niranjana, R. W. Prager, K. J. Dalton, R. Derom, and J. Chalmers. The QAMC project: A case study of neural networks for medical risk prediction. In T. Downs, M. Freen, and M. Gallagher, editors, *Australian Conference on Neural Networks*, pages 153–157. Brisbane, February 1998.
- [C53] R. W. Prager, A. H. Gee, and L. Berman. 3D ultrasound without voxels. In *Medical Image Understanding and Analysis*, pages 93–96. Leeds, July 1998.
- [C54] R. W. Prager, A. H. Gee, and L. Berman. Real time tools for freehand 3-D ultrasound. In *Proceedings of the 1st International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 1016–1023. Boston, October 1998.
- [C55] M. J. J. Scott, M. Niranjana, and R. W. Prager. Realisable classifiers: Improving the operating performance on variable cost problems. In P. H. Lewis and M. S. Nixon, editors, *Proceedings of the British Machine Vision Conference*, pages 306–315. Southampton, September 1998.
- [C56] C. M. Sherratt, A. M. Basman, R. W. Prager, and A. H. Gee. Interactive segmentation of ultrasound images by creep-and-merge. In *Medical Image Understanding and Analysis*, pages 133–136. Leeds, July 1998.
- [C57] C. R. Dance, M. H. Syn, R. W. Prager, A. H. Gee, J. P. M. Gosling, and L. H. Berman. Interactive segmentation of 3D ultrasound using deformable solid models and active contours. In *Medical Image Understanding and Analysis*, pages 25–28. Oxford, July 1997.
- [C58] C. R. Dance, M. H. Syn, R. W. Prager, J. P. M. Gosling, L. H. Berman, and K. J. Dalton. Interactive segmentation of 3D ultrasound using deformable solid models and active contours. In *Image Analysis and Processing*, volume 2, pages 412–419. Florence, September 1997.
- [C59] D. G. Melvin, M. Niranjana, R. W. Prager, A. K. Trull, and V. F. Hughes. Neurocomputing applications in post-operative liver transplant monitoring. In *Proceedings of the 1997 IEEE Workshop on Neural Networks for Signal Processing VII*, pages 216 – 225. IEEE, Amelia Island Plantation, Florida, USA, September 1997.
- [C60] D. G. Melvin, M. Niranjana, R. W. Prager, A. K. Trull, V. F. Hughes, and G. Alexander. Application of neural networks to post-operative liver transplant monitoring. In *Proceedings of the Fifth International Conference on Artificial Neural Networks*, pages 323–328. IEE, Churchill College, University of Cambridge, July 1997.
- [C61] R. Rohling, A. H. Gee, R. W. Prager, and L. Berman. 3-D spatial compounding of ultrasound images. In *Medical Image Understanding and Analysis*, pages 37–40. Oxford, July 1997.
- [C62] B. Rosario, D. R. Lovell, M. Niranjana, R. W. Prager, and K. J. Dalton. Self-organization with a large medical database: using the GTM for prediction and clustering. In *9th Italian Workshop on Neural Nets*. Vietri sul Mare, Italy, May 1997.

- [C63] M. J. J. Scott and R. W. Prager. Cut n' shuffle: a novel algorithm for selecting feature subsets for classification tasks. In *Irish Machine Vision and Image Processing VII*. IAPR, Sept 1997.
- [C64] C. R. Dance, R. J. A. Lapeer, and R. W. Prager. 3D finite element model of a female pelvis reconstructed from CT images. In M. Ackerman and V. Spitzer, editors, *Visible Human Project Conference*. Bethesda, Maryland, October 1996.
- [C65] D. R. Lovell, C. R. Dance, M. Niranjana, R. W. Prager, and K. J. Dalton. An algorithm to help select useful predictors of patient outcome. In *Society for medical decision making 18th Annual Conference*. Toronto, Canada, 1996.
- [C66] D. R. Lovell, C. R. Dance, M. Niranjana, R. W. Prager, and K. J. Dalton. Ranking the effect of different features on the classification of discrete valued data. In *International Conference on Engineering Applications of Neural Networks*, pages 487–494. Kingston on Thames, London, 1996.
- [C67] D. R. Lovell, C. R. Dance, M. Niranjana, R. W. Prager, and K. J. Dalton. Using upper bounds on discrimination to select discrete valued features. In S. Usui, Y. Tohkura, S. Katagiri, and E. Wilson, editors, *Neural Networks for Signal Processing VI*, pages 233–242. Keihanna, Japan, 1996.
- [C68] D. R. Lovell, C. R. Dance, M. Niranjana, R. W. Prager, and K. J. Dalton. What patient information allows us to make accurate predictions of outcome? In *18th Annual International Conference of IEEE Engineering in Medicine and Biology Society*. Amsterdam, the Netherlands, 1996.
- [C69] M. H. Syn and R. W. Prager. A model based approach to 3D freehand ultrasound imaging. In Y. Bizais, C. Barillot, and R. Di Paola, editors, *Information Processing in Medical Imaging*, Computational Imaging and Vision, pages 361–362. Kluwer Academic, 1995.
- [C70] M. H. Syn, R. W. Prager, L. H. Berman, P. Gosling, and D. Lomas. Shape registration in 3D freehand ultrasound: Eigenmodes as shape features. *Radiology*, 197(P):192, November 1995.
- [C71] M. H. Syn, R. W. Prager, L. H. Berman, P. Gosling, and D. Lomas. Shape segmentation in 3D freehand ultrasound: An iterative algorithm for defining tissue boundaries. *Radiology*, 197(P):162, November 1995.
- [C72] G. F. Harpur and R. W. Prager. A fast method for activating competitive self-organising neural networks. In *Proc. 1994 International Symposium on Artificial Neural Networks*, pages 412–418. 1994.
- [C73] R. W. Prager. CART/CMAC hybrid: Regression trees with interpolation. In *Proceedings of the IEEE 12th International Conference on Pattern Recognition*. Jerusalem, October 1994.
- [C74] M. J. J. Scott and R. W. Prager. Combining class and gradient based segmentation techniques for elimination of redundant processing. In *Proceedings of TECOM AI Technology Symposium, TRI-S Publications*. Maryland, USA, September 1994.
- [C75] M. H. Syn, J. P. M. Gosling, R. W. Prager, L. Berman, and J. Crowley. Tracking the inter-frame deformation of structures in 3D ultrasound imaging. In R. Robb, editor, *Visualization Biomedical Computing*, volume 2359 of *Proc. SPIE*, pages 170–179. 1994.
- [C76] C. K. Tham and R. W. Prager. A modular Q-learning architecture for manipulator task decomposition. In *Proceedings of the Eleventh International conference on Machine Learning*. Rutgers, New Brunswick, July 1994.
- [C77] Y. Tremblay and R. W. Prager. Unconstrained handwriting recognition using linked character models. In *Proceedings of the Fourth International Workshop on Frontiers in Handwriting Recognition*, pages 449–455. Taipei, Taiwan. Republic of China, December 1994.
- [C78] H. E. Ayestaran and R. W. Prager. Towards continuously learning neural networks. In *Prococeedings of the IEEE International Conference on Neural Networks*. Japan, November 1993.
- [C79] L. H. Berman, J. P. M. Gosling, D. J. Lomas, and R. W. Prager. The application of virtual reality technology to the sonographic assessment of femoral neck anteversion. In *Work in Progress Abstracts in Proceedings of the Radiology + Oncology 1993 — the 51st Annual Congress of the British Institute of Radiology*. Glasgow, May 1993.
- [C80] J. P. M. Gosling, D. J. Lomas, R. W. Prager, and L. A. Berman. Probe proprioception in 3D ultrasound reconstruction. In *Proceedings of the Association of University Radiologists meeting*. Leicester, March 1993.

- [C81] J. P. M. Gosling, D. J. Lomas, R. W. Prager, and L. A. Berman. Virtual reality technology in the assessment of femoral neck anteversion. In *Proceedings of the Radiological Society of North America 79th Scientific Assembly and Annual Meeting*. November – December 1993.
- [C82] K.-G. Lim and R. W. Prager. Integrating visual modules, a Bayesian approach. In *Proceedings of the SPIE conference 1956 on Sensor Fusion and Aerospace Applications*. April 1993.
- [C83] K.-G. Lim and R. W. Prager. Using a Markov random field to integrate stereo modules. In *Proceedings of the 8th Scandinavian Conference on Image Analysis*. May 1993.
- [C84] R. W. Prager. Networks based on Kanerva’s sparse distributed memory: results showing their strengths and limitations, and a new algorithm to design the location matching layer. In *Proceedings of the IEEE International Conference on Neural Networks*. San Francisco, March 1993.
- [C85] C. K. Tham and R. W. Prager. Reinforcement learning methods for multi-linked manipulator obstacle avoidance and control. In *Proceedings of the IEEE Asia-Pacific Workshop on Advances in Motion Control*. Singapore, July 1993.
- [C86] R. E. Daniel, H. Cha, R. W. Prager, J. Shapiro, F. Fallside, and A. E. Knowles. The Ex-static project: simulating parallel architectures for neural network modelling. In *Proceedings of the Joint Framework for Information Technology Conference*. University of Sussex, March 1992.
- [C87] A. J. Piper and R. W. Prager. A high-level object-oriented approach to divide-and-conquer. In *Proceedings of the Fourth IEEE Symposium on Parallel and Distributed Processing*. Arlington, Texas, December 1992.
- [C88] C. K. Tham and R. W. Prager. Reinforcement learning for multi-link manipulator control. In *Proceedings of the 6th Annual Conference on Systems Research Informatics and Cybernetics*. Baden Baden, August 1992.
- [C89] R. Daniel, H. Cha, R. W. Prager, P. Jones, A. Knowles, J. Shapiro, F. Fallside, and T. P. Marsland. Simulation of parallel architectures for neural networks: the Ex-static project. In *Workshop on Abstract Machine Models for Highly Parallel Computers*. Leeds, 1991.
- [C90] A. H. Gee, S. V. B. Aiyer, and R. W. Prager. A subspace approach to invariant pattern recognition using Hopfield networks. In *Proceedings of the International Joint Conference on Neural Networks*, pages 795–800. Singapore, November 1991.
- [C91] N. H. Russell, F. Fallside, A. J. Robinson, and R. W. Prager. Lexical access using a recurrent error propagation network. In *Proceedings of the European Conference on Speech Technology*, pages 1023–1027. Genoa, Italy, October 1991.
- [C92] F. Fallside, H. Lucke, T. Marsland, P. O’Shea, R. W. Prager, A. J. Robinson, and N. Russell. Continuous speech recognition for the Timit database using neural networks. In *Proceedings of the IEEE International Conference on Acoustics Speech and Signal Processing*. Albuquerque, April 1990.
- [C93] M. D. Bedworth, L. Bottou, J. S. Bridle, F. Fallside, L. Flynn, F. Fogelman, K. M. Ponting, and R. W. Prager. Comparison of neural and conventional classifiers on a speech recognition problem. In *Proceedings of the First IEE International Conference on Artificial Neural Networks*, pages 86–89. London, October 1989.
- [C94] R. W. Prager, T. Clarke, and F. Fallside. The modified Kanerva model: results for real time word recognition. In *Proceedings IEE 1st International Conference on Artificial Neural Networks*, pages 105–109. London, October 1989.
- [C95] F. Fallside, T. Harrison, R. Prager, and A. Robinson. A comparison of three connectionist models for phoneme recognition in continuous speech. In *Proceedings of the ATR Workshop on Neural Networks and Parallel Distributed Processing*. Osaka, 1988.

Invited Conference Presentations

- [D1] R. W. Prager, W. H. Gomersall, U. Z. Ijaz, A. H. Gee, G. M. Treece, and N. G. Kingsbury. 3D ultrasound. In *Proceedings of the 21st Euroson Congress*, pages 5–6. Edinburgh, Dec 2009.

- [D2] R. W. Prager, A. H. Gee, G. M. Treece, N. G. Kingsbury, J. E. Lindop, H. Gomersall, and H.-C. Shin. Deconvolution and elastography based on three-dimensional ultrasound. In *Proceedings — IEEE International Ultrasonics Symposium (IUS)*, pages 548–557. Beijing, China, Nov 2008.
- [D3] G. M. Treece, A. H. Gee, and R. W. Prager. Radiotherapy planning with freehand 3D ultrasound. In *Bioengineering 08*. London, U.K., September 2008.
- [D4] R. W. Prager, G. M. Treece, A. H. Gee, and J. E. Lindop. Medical images from sound reflections. University of Cambridge Alumni Weekend, Cambridge, UK, September 2007.
- [D5] R. W. Prager, G. M. Treece, and A. H. Gee. Stradx: the highest definition freehand 3D ultrasound system in the world. Cambridge University Engineers’ Association annual conference, Cambridge, UK, September 2003.
- [D6] G. M. Treece, R. W. Prager, A. H. Gee, C. J. C. Cash, and L. H. Berman. Freehand 3D ultrasound for tumour bed localization to improve breast radiotherapy planning. Tutorial presented at Medical Image Computing and Computer-Assisted Intervention (MICCAI 2003), Montreal, Canada, November 2003.
- [D7] R. W. Prager, A. H. Gee, and G. M. Treece. The Stradx freehand 3D ultrasound system. Tutorial at the Euroson school on 3D Ultrasound Imaging organised by Imperial College Faculty of Medicine in association with the British Medical Ultrasound Society, Hammersmith Hospital, London, April/May each year: 2002, 2003, 2004.
- [D8] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Freehand 3D ultrasound without voxels: volume measurement and visualisation using the stradx system. Presented at Ultrasonics International (UI01), Delft, The Netherlands, July 2001.
- [D9] R. W. Prager, A. H. Gee, and G. M. Treece. Sequential 3D diagnostic ultrasound using the stradx system. Tutorial presented at Medical Image Computing and Computer-Assisted Intervention MICCAI’99, Cambridge, UK, September 1999.

Thesis, Patents and Book Chapters

- [B1] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Freehand 3D ultrasound calibration: a review. In C. W. Sensen and B. Hallgrímsson, editors, *Advanced Imaging in Biology and Medicine*, chapter 3, pages 47–84. Springer, December 2008. ISBN: 978-3-540-68992-8.
- [B2] R. W. Prager. *System and method for three-dimensional imaging*. British Patent specification, filed on 15 January 2002, Application number GB0200847.2, 2002.
- [B3] G. F. Harpur and R. W. Prager. Experiments with low-entropy neural networks. In R. Baddeley, P. Hancock, and P. Földiák, editors, *Information theory and the brain*, chapter 5, pages 84–100. Cambridge University Press, 2000.
- [B4] D. Pollard, R. Best, D. Bonner, R. Chinn, W. Cousins, T. Davies, K. Fidler, E. Fisher, J. Flower, D. Green, D. Heffer, D. Morrey, R. Prager, A. Purvis, N. Syred, G. Taylor, and C. Thomas. *Academic standards — Engineering*. Quality Assurance Agency for Higher Education, 2000.
- [B5] R. W. Prager. *Ultrasound machine calibration*. British Patent specification, filed on 11 August 1997, Application number GB9716994.0, 1997.
- [B6] R. W. Prager and T. P. Love. Use of a departmental computerised teaching survey to aid improvement. In N. J. Jackson, editor, *Managing quality and standards in UK higher education: approaches to self-evaluation and self-regulation*, pages 67–70. Higher Education Quality Council, 1997.
- [B7] M. D. D. Andrews and R. W. Prager. Genetic programming for the acquisition of double auction market strategies. In K. E. Kinneer Jr., editor, *Advances in Genetic Programming*, chapter 16, pages 355–368. MIT Press, 1994.
- [B8] R. W. Prager. *Parallel Processing Networks for automatic speech recognition*. Ph.D. thesis, Cambridge University, 1987.

Technical Reports

- [T1] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A data weighting scheme for quasi-static ultrasound elasticity imaging. Technical Report CUED/F-INFENG/TR 651, Cambridge University Department of Engineering, May 2010.
- [T2] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A normalization method for axial-shear strain elastography. Technical Report CUED/F-INFENG/TR 645, Cambridge University Department of Engineering, April 2010.
- [T3] U. Z. Ijaz, R. W. Prager, A. H. Gee, and G. M. Treece. Rapid hybrid ultrasound volume registration. Technical Report CUED/F-INFENG/TR.644, Cambridge University Department of Engineering, March 2010.
- [T4] W. H. Gomersall, N. G. Kingsbury, R. W. Prager, H.-C. Shin, G. M. Treece, and A. H. Gee. Parameter initialisation for three-dimensional ultrasound deconvolution. Technical Report CUED/F-INFENG/TR 640, Cambridge University Department of Engineering, 2009.
- [T5] R. J. Housden, A. H. Gee, G. M. Treece, and R. W. Prager. 3D ultrasonic strain imaging using free-hand scanning and a mechanically-swept probe. Technical Report CUED/F-INFENG/TR623, Cambridge University Engineering Department, January 2009.
- [T6] U. Z. Ijaz, R. W. Prager, A. H. Gee, and G. M. Treece. Optimisation strategies for ultrasound volume registration. Technical Report CUED/F-INFENG/TR.635, Cambridge University Department of Engineering, March 2009.
- [T7] H.-C. Shin, R. W. Prager, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Estimation of speed of sound in dual-layered media using medical ultrasound image deconvolution. Technical Report CUED/F-INFENG/TR.637, Cambridge University Department of Engineering, September 2009.
- [T8] H.-C. Shin, R. W. Prager, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Estimation of speed of sound using medical ultrasound image deconvolution. Technical Report CUED/F-INFENG/TR.626, Cambridge University Engineering Department, April 2009.
- [T9] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Uniform precision ultrasound strain imaging. Technical Report CUED/F-INFENG/TR.624, Cambridge University Engineering Department, March 2009.
- [T10] L. Chen, R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. A hybrid displacement estimation method for ultrasonic elasticity imaging. Technical Report CUED/F-INFENG/TR 615, Cambridge University Department of Engineering, November 2008.
- [T11] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Nonparametric surface regression for strain estimation. Technical Report CUED/F-INFENG/TR 598, Cambridge University Engineering Department, March 2008.
- [T12] H.-C. Shin, R. W. Prager, J. K. H. Ng, W. H. Gomersall, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Sensitivity to point-spread function parameters in medical ultrasound image deconvolution. Technical Report CUED/F-INFENG/TR.600, Cambridge University Engineering Department, April 2008.
- [T13] L. Chen, G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. A quality-guided displacement tracking algorithm for ultrasonic elasticity imaging. Technical Report CUED/F-INFENG/TR 593, Cambridge University Department of Engineering, January 2007.
- [T14] R. J. Housden, A. H. Gee, R. W. Prager, and G. M. Treece. Rotational motion in sensorless freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR587, Cambridge University Engineering Department, October 2007.
- [T15] R. J. Housden, G. M. Treece, A. H. Gee, and R. W. Prager. Hybrid systems for reconstruction of free-hand 3D ultrasound data. Technical Report CUED/F-INFENG/TR574, Cambridge University Engineering Department, March 2007.
- [T16] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Freehand 3D ultrasound calibration: a review. Technical Report CUED/F-INFENG/TR.584, Cambridge University Department of Engineering, December 2007.

- [T17] P. W. Hsu, G. M. Treece, R. W. Prager, N. E. Houghton, and A. H. Gee. Comparison of freehand 3D ultrasound calibration techniques using a stylus. Technical Report CUED/F-INFENG/TR.579, Cambridge University Department of Engineering, June 2007.
- [T18] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. An intelligent interface for freehand strain imaging. Technical Report CUED/F-INFENG/TR578, Cambridge University Engineering Department, May 2007.
- [T19] G. M. Treece, J. E. Lindop, A. H. Gee, and R. W. Prager. Freehand ultrasound elastography with a 3D probe. Technical Report CUED/F-INFENG/TR.577, Cambridge University Department of Engineering, May 2007.
- [T20] R. J. Housden, A. H. Gee, G. M. Treece, and R. W. Prager. Sensorless reconstruction of unconstrained freehand 3D ultrasound data. Technical Report CUED/F-INFENG/TR553, Cambridge University Engineering Department, May 2006.
- [T21] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Real-time freehand 3D ultrasound calibration. Technical Report CUED/F-INFENG/TR565, Cambridge University Engineering Department, September 2006.
- [T22] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Dynamic resolution selection in ultrasonic strain imaging. Technical Report CUED/F-INFENG/TR 566, Cambridge University Engineering Department, September 2006.
- [T23] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Estimation of displacement location for enhanced strain imaging. Technical Report CUED/F-INFENG/TR550, Cambridge University Engineering Department, March 2006.
- [T24] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. Phase-based ultrasonic deformation estimation. Technical Report CUED/F-INFENG/TR 555, Cambridge University Engineering Department, May 2006.
- [T25] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Wavelet restoration of medical pulse-echo ultrasound images in an EM framework. Technical Report CUED/F-INFENG/TR 554, Cambridge University Engineering Department, May 2006.
- [T26] G. M. Treece, R. W. Prager, and A. H. Gee. Ultrasound compounding with automatic attenuation compensation using paired angle scans. Technical Report CUED/F-INFENG/TR.558, Cambridge University Department of Engineering, June 2006.
- [T27] A. H. Gee, R. J. Housden, P. Hassenpflug, G. M. Treece, and R. W. Prager. Sensorless freehand 3D ultrasound in real tissue: speckle decorrelation without fully developed speckle. Technical Report CUED/F-INFENG/TR.510, Cambridge University Department of Engineering, January 2005.
- [T28] P. Hassenpflug, R. W. Prager, G. M. Treece, and A. H. Gee. Speckle classification for sensorless three-dimensional ultrasound. Technical Report CUED/F-INFENG/TR 513, Cambridge University Engineering Department, February 2005.
- [T29] R. J. Housden, A. H. Gee, G. M. Treece, and R. W. Prager. Sub-sample interpolation strategies for sensorless freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR545, Cambridge University Engineering Department, January 2005.
- [T30] P. W. Hsu, R. W. Prager, A. H. Gee, and G. M. Treece. Rapid, easy and reliable calibration for freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR534, Cambridge University Engineering Department, August 2005.
- [T31] J. E. Lindop, G. M. Treece, A. H. Gee, and R. W. Prager. 3D elastography using freehand ultrasound. Technical Report CUED/F-INFENG/TR531, Cambridge University Engineering Department, July 2005.
- [T32] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Modelling ultrasound imaging as a linear shift-variant system. Technical Report CUED/F-INFENG/TR.509, Cambridge University Engineering Department, January 2005.
- [T33] J. K. H. Ng, R. W. Prager, N. G. Kingsbury, G. M. Treece, and A. H. Gee. Tomographic reconstruction of the point-spread function of an ultrasonic imaging system for deconvolution. Technical Report CUED/F-INFENG/TR 529, Cambridge University Department of Engineering, 2005.

- [T34] A. H. Gee, N. E. Houghton, G. M. Treece, and R. W. Prager. 3D ultrasound probe calibration without a position sensor. Technical Report CUED/F-INFENG/TR.488, Cambridge University Department of Engineering, September 2004.
- [T35] G. M. Treece, A. H. Gee, and R. W. Prager. RF and amplitude-based probe pressure correction for 3D ultrasound. Technical Report CUED/F-INFENG/TR.491, Cambridge University Department of Engineering, August 2004.
- [T36] G. M. Treece, R. W. Prager, and A. H. Gee. Ultrasound attenuation measurement in the presence of scatterer variation for reduction of shadowing and enhancement. Technical Report CUED/F-INFENG/TR.502, Cambridge University Department of Engineering, November 2004.
- [T37] A. H. Gee, G. M. Treece, R. W. Prager, C. J. C. C. Cash, and B. L. H. Rapid registration for wide field-of-view freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.447, Cambridge University Department of Engineering, January 2003.
- [T38] R. W. Prager, A. H. Gee, G. M. Treece, C. J. C. Cash, and L. H. Berman. Using image-based regression to acquire freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.436, Cambridge University Engineering Department, June 2002.
- [T39] G. M. Treece, A. H. Gee, R. W. Prager, C. J. C. Cash, and L. H. Berman. High resolution freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.438, Cambridge University Engineering Department, August 2002.
- [T40] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Speckle detection in ultrasound images using first order statistics. Technical Report CUED/F-INFENG/TR.415, Cambridge University Engineering Department, July 2001.
- [T41] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Correction of probe pressure artifacts in freehand 3D ultrasound — further results and convex probes. Technical Report CUED/F-INFENG/TR.421, Cambridge University Engineering Department, October 2001.
- [T42] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Correction of probe pressure artifacts in freehand 3D ultrasound — initial results. Technical Report CUED/F-INFENG/TR.411, Cambridge University Engineering Department, April 2001.
- [T43] A. H. Gee, R. W. Prager, G. M. Treece, and L. H. Berman. Narrow-band volume rendering for freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.392, Cambridge University Engineering Department, September 2000.
- [T44] R. W. Prager, A. H. Gee, G. M. Treece, and L. H. Berman. Decompression and speckle detection for ultrasound images using a homodyned k-distribution. Technical Report CUED/F-INFENG/TR.397, Cambridge University Engineering Department, November 2000.
- [T45] G. M. Treece, R. W. Prager, and A. H. Gee. Volume-based three-dimensional metamorphosis using region correspondence. Technical Report CUED/F-INFENG/TR.379, Cambridge University Engineering Department, September 2000.
- [T46] A. H. Gee, R. W. Prager, and L. H. Berman. Non-planar reslicing for freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.340, Cambridge University Engineering Department, January 1999.
- [T47] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. 3D ultrasound examination of large organs. Technical Report CUED/F-INFENG/TR.367, Cambridge University Engineering Department, December 1999.
- [T48] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Surface interpolation from sparse cross-sections using region correspondence. Technical Report CUED/F-INFENG/TR.342, Cambridge University Engineering Department, March 1999.
- [T49] P. M. Tuomola, A. H. Gee, R. W. Prager, and L. H. Berman. Body-centered visualisation for freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.362, Cambridge University Department of Engineering, October 1999.

- [T50] R. W. Prager, A. H. Gee, and L. H. Berman. Stradx: real-time acquisition and visualization of freehand 3D ultrasound. Technical Report CUED/F-INFENG/TR.319, Cambridge University Engineering Department, April 1998.
- [T51] M. J. J. Scott, M. Niranjana, D. G. Melvin, and R. W. Prager. Maximum realisable performance: a principled method for enhancing performance by using multiple classifiers. Technical Report CUED/F-INFENG/TR.320, Cambridge University Engineering Department, April 1998.
- [T52] G. M. Treece, R. W. Prager, and A. H. Gee. Regularised marching tetrahedra: improved iso-surface extraction. Technical Report CUED/F-INFENG/TR.333, Cambridge University Engineering Department, September 1998.
- [T53] G. M. Treece, R. W. Prager, A. H. Gee, and L. H. Berman. Fast surface and volume estimation from non-parallel cross-sections, for freehand 3-D ultrasound. Technical Report CUED/F-INFENG/TR.326, Cambridge University Engineering Department, July 1998.
- [T54] C. R. Dance and R. W. Prager. Reconstruction from multi-axial contours by Delaunay triangulation. Technical Report CUED/F-INFENG/TR 273, Cambridge University Department of Engineering, January 1997.
- [T55] R. J. A. Lapeer and R. W. Prager. 3-D warping of homological objects using thin-plate splines. Technical Report CUED/F-INFENG/TR292, Cambridge University Engineering Department, May 1997.
- [T56] D. R. Lovell, M. Niranjana, R. W. Prager, K. J. Dalton, and R. Derom. A guide to the QAMC obstetric risk prediction web page. Technical Report CUED/F-INFENG/TR301, Cambridge University Engineering Department, September 1997.
- [T57] D. R. Lovell, M. J. J. Scott, M. Niranjana, R. W. Prager, K. J. Dalton, and R. Derom. On the use of expected attainable discrimination for feature selection in large scale medical risk prediction problems. Technical Report CUED/F-INFENG/TR299, Cambridge University Engineering Department, August 1997.
- [T58] R. W. Prager, R. N. Rohling, A. H. Gee, and L. Berman. Automatic calibration for 3-D free-hand ultrasound. Technical Report CUED/F-INFENG/TR303, Cambridge University Engineering Department, September 1997.
- [T59] C. R. Dance and R. W. Prager. Active contour segmentation of medical ultrasound images. Technical Report CUED/F-INFENG/TR 274, Cambridge University Department of Engineering, October 1996.
- [T60] D. R. Lovell, C. R. Dance, M. Niranjana, R. W. Prager, and K. J. Dalton. Limits on the discrimination possible with discrete valued data, with application to medical risk prediction. Technical Report CUED/F-INFENG/TR243, Cambridge University Engineering Department, July 1996.
- [T61] G. F. Harpur and R. W. Prager. Techniques in low entropy coding with neural networks. Technical Report CUED/F-INFENG/TR 197, Cambridge University Engineering Department, November 1995.
- [T62] M. H. Syn and R. W. Prager. Bayesian registration of models using FEM eigenmodes. Technical Report CUED/F-INFENG/TR 213, Cambridge University Engineering Department, September 1995.
- [T63] M. H. Syn and R. W. Prager. A biological growth metric for 3D shape registration. Technical Report CUED/F-INFENG/TR 225, Cambridge University Engineering Department, July 1995.
- [T64] M. H. Syn and R. W. Prager. FEM eigenmodes as shape features. Technical Report CUED/F-INFENG/TR 211, Cambridge University Engineering Department, May 1995.
- [T65] G. F. Harpur and R. W. Prager. Experiments with simple Hebbian-based learning rules in pattern classification tasks. Technical Report CUED/F-INFENG/TR 168, Cambridge University Engineering Department, February 1994.
- [T66] M. H. Syn and R. W. Prager. Mesh models for three-dimensional ultrasound imaging. Technical Report CUED/F-INFENG/TR 210, Cambridge University Engineering Department, December 1994.
- [T67] M. H. Syn and R. W. Prager. Model-based three-dimensional ultrasound imaging. Technical Report CUED/F-INFENG/TR 180, Cambridge University Engineering Department, October 1994.

- [T68] A. J. Piper and R. W. Prager. Generalized parallel programming with divide-and-conquer: the Beeblebrox system. Technical Report CUED/F-INFENG/TR132, Cambridge University Department of Engineering, 1993.
- [T69] A. H. Gee and R. W. Prager. Alternative energy functions for optimizing neural networks. Technical Report CUED/F-INFENG/TR 95, Cambridge University Department of Engineering, March 1992.
- [T70] A. H. Gee and R. W. Prager. Polyhedral combinatorics and neural networks. Technical Report CUED/F-INFENG/TR 100, Cambridge University Department of Engineering, May 1992.
- [T71] K.-G. Lim and R. W. Prager. Using Markov random fields to integrate stereo modules. Technical Report CUED/F-INFENG/TR.109, Cambridge University Engineering Department, July 1992.
- [T72] R. W. Prager. Some experiments with fixed non-linear mappings and single layer networks. Technical Report CUED/F-INFENG/TR.106, Cambridge University Engineering Department, July 1992.
- [T73] A. H. Gee, S. V. B. Aiyer, and R. W. Prager. Neural networks and combinatorial optimization problems — the key to a successful mapping. Technical Report CUED/F-INFENG/TR 77, Cambridge University Department of Engineering, July 1991.
- [T74] A. H. Gee, S. V. B. Aiyer, and R. W. Prager. A subspace approach to invariant pattern recognition using Hopfield networks. Technical Report CUED/F-INFENG/TR 62, Cambridge University Department of Engineering, January 1991.