

Curriculum Vitae

Personal Details:

Name: Mr David Michael Brookes
Date of Birth: 22 January 1951
Nationality: British

Contact Details:

Address: EEE Dept, Imperial College, Exhibition Rd, London SW7 2BT
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WWW: <http://www.ee.ic.ac.uk/hp/staff/dmb/dmb.html>

Education:

1964-69	Winchester College	A-level Passes in Maths (A2), Further Maths (A), Physics (A1) and Economics (B)
1969-72	Cambridge University	BA (Mathematics), 2 nd class Honours degree
1972-73	Cambridge University	Postgraduate Certificate in Education

Memberships:

Member of IEEE, IET, BMVA, AES

Professional Experience:

1973-77	Engineer, Remote Sensing Laboratory, MIT, Cambridge, Mass, USA. My work involved the design of astronomical instrumentation and telescope control systems.
1977-79	Research Assistant, Imperial College. I was involved with the analysis of signals derived from a variety of biological systems.
1979-	Lecturer, then Senior Lecturer (1991) then Reader (2004) in EEE Dept, Imperial College, London. 1999-2008 Deputy Head of Dept 2010: Engineering Faculty award for excellence in teaching

Current Research Areas

- Enhancement of very poor quality speech
- Computer vision using multiple views
- Speaker verification and identification
- Seismic Target tracking and Perimeter Security
- Radar Target identification using Hidden Markov modelling.

Grants

1. Brookes, D. M., Naylor, P. A. N. & Huckvale, M. "Speech Cleaning for Law Enforcement", *Home Office*, £1,113k, 2007-2012 (P13566)
2. Dragotti, P.L. & Brookes, D.M., "Sensor Arrays for Scene Interpretation and Target Classification", *SEAS DTC, Selex UK*, £79k, 2008-2009 (P19596; extension to P03852)
3. Brookes, D. M. & Dragotti, P.L., "Unsupervised 3-D multiview scene learning and updating ", *General Dynamics UK, DIF DTC* , £156k, 2007-2009 (P11195)
4. Brookes, D. M. "Sensor Information Processing and Management (SIPAM)", *QinetiQ UK*, £50k, 2007-2008 (P06378)
5. Dragotti, P. L. & Brookes, D. M., "Integrated Sensor Arrays for Scene Interpretation and Target Classification", *SEAS DTC, Selex UK*, £229k, 2005-2008 (P03532)
6. Brookes, D. M., "Multi-modal System for Perimeter Security", in collaboration with Thales Research & Technology (UK) Ltd and Thales Land & Joint Systems, *DTI*. £120k, 2005-2007. (P03852)
7. Brookes, D. M., "Adaptive Markov Models for Signature Extraction" , *General Dynamics DIF DTC*, 2003-2006 (PN1861)

8. Brookes, D. M., Naylor, P. A. N., Cheung, P. Y. K., Burdett, A. J. & Constantinides, A. G., "Zero IF Architectures for DAB Receivers", *Panasonic System LSI Design Europe*, £240k, 2001-2004 (PN1389)
9. Naylor, P. A. & Brookes, D. M., "Novel Features for Speaker Verification", *EPSRC GR/N01569*, £144k, 2000-2003 (PR0813)
10. Cheung, P. Y. K., Brookes, D. M. & Clarke, T. J. W., "Architectures and Designs for Video Compression", *LSI Logic*, £482k, 1999-2002 (PN0752)
11. Cheung, P. Y. K., Luk, W. & Brookes, D. M., "Real-time FPGA Architectures", *Teaching Company Directorate/Motorola*. £353k, 1997-2002 (5752/3901)
12. Brookes, D. M. & Naylor, P. A., "Acoustic Echo Control", *LG Semicon*, £80k, 1997-1998
13. Brookes, D. M., "Feature Space Transformations for Speaker-Adaptive Speech Recognition", *SERC GR/J51757*, £124k, 1994-1997
14. Brookes, D. M., "Speech Enhancement", *Pacific Comm Sciences*, £9k, 1993-1996.
15. Brookes, D. M., "Digital Halftoning", *Crossfield Electronics*, 1990-1993.
16. Brookes, D. M., "Inverse Filtering for Speaker Quantification", *SERC GR/E90922*, £70k, 1989-1992.
17. Constantinides, A. G. & Brookes, D. M., "Speech Interfacing & Phonetic Algorithms" *Alvey/SERC GR/D15904 & GR/E64695*, £275k, 1985-1988.

Journal Publications:

1. A. Chorti and M. Brookes. Performance analysis of COFDM and DAB receivers in narrow-band and tonal interference. *Telecommunication Systems Journal*, 46 (2), Feb. 2011.
2. J. Gudnason, J. Cui, and M. Brookes. SAR automatic target recognition from super-resolution scattering center features. *IEEE Trans Aerosp Electron Syst*, 45 (4): 1512–1524, Oct. 2009. doi: 10.1109/TAES.2009.5310314.
3. Bouganis, C.-S. and Brookes, M. "Statistical Multiple Light Source Detection". *IET Computer Vision*, 1(2):79–91, June 2007. doi: 10.1049/iet-cvi:20065001.
4. Naylor, P.A., Kounoudes, A., Gudnason, J. and Brookes, M., "Estimation of Glottal Closure Instants in Voiced Speech using the DYPSA Algorithm" *IEEE Transactions on Speech and Audio Processing*, 15(1):34-43, 2007
5. Naylor, P.A., Cui, J. and Brookes, M., "Adaptive Algorithms for Sparse Echo Cancellation", *Signal Processing*, 86(6):1182-1192, 2006
6. Brookes, M., Naylor, P.A. and Gudnason, J. "A Quantitative Assessment of Group Delay Methods for Identifying Glottal Closures in Voiced Speech" *IEEE Transactions on Speech and Audio Processing*, 14(2):456-466, 2006
7. Chorti, A. & Brookes, M. A Spectral Model for RF Oscillators with Power-Law Phase Noise *IEEE Trans on Circuits and Systems I*, 53(9):1989-1999, 2006
8. Chorti, A. & Brookes, M. On the Effects of Memoryless Nonlinearities on M-QAM and DQPSK OFDM Signals *IEEE Trans in Microwave Theory and Techniques*, 54(8):3301-3315, 2006.
9. Androutopoulos, V, Brookes and M. Clarke T.J.W., "Protocol Converter Synthesis" *IEE Proc Computers and Digital Techniques*, 151(6):391-401, Nov 2004.
10. Bouganis, C.-S. & Brookes, M. "Multiple Light Source Detection" *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 26(4):509-514, April 2004.
11. Brookes, D.M., "Coloured Noise generation without Filter Startup Transient", *Electronics Letters*, 37(4):255-256, Feb 2001.
12. Brookes, D.M. "Algorithms for Max and Min Filters with Improved Worst-Cases Performance", *IEEE Trans on Circuits & Systems -II*, 47(9):930-935, Sept 2000
13. Brookes, D. M. and Loke, H.P. "Energy Flow in Lossless Tube Model of Vocal Tract with Applications to Glottal Closure and Opening Detection", *Electronics Letters*, 34(23):2202-2204, Nov 1998.
14. Brookes, D.M. and Leung, M.H., "Stereophonic Speech Recognition in Noise using compensated Hidden Markov models", *Electronics Letters*, 34(19):1827-1829, Sept 1998.
15. Bound, J. P., P. W. Harvey, and D. M. Brookes, "The Incidence of Anencephalus in the Fylde Peninsula 1956-76 and Changes in Water Hardness," *J. Epidem and Comm Health*, 35(2):102-105, June 1981.

16. Brookes, M., "Digital Solid-state Scan-Converter with Unusual Display Capabilities," *Applied Optics*, 14(8):1835-1838, Aug 1975.
17. Brookes, M., "An Inexpensive Automatic Telescope Dome Controller," *Rev Sci Instrum*, 45(11):1372-1374, Nov 1974.

Conference Publications:

1. C. Gilliam, P. L. Dragotti, and M. Brookes. A closed-form expression for the bandwidth of the plenoptic function under finite field of view constraints. *Proc Intl Conf Image Processing*, 2010.
2. Naylor, P. A., Gaubitch, N. D., Sharma, D., Hilkhuyzen, G., Huckvale, M. and Brookes, M. Intelligibility Estimation in Law Enforcement Speech Processing, *Proc ITG Conf on Speech Communication*, Bochum, 2010
3. D. Sharma, G. Hilkhuyzen, N. D. Gaubitch, P. A. Naylor, M. Brookes, and M. Huckvale. Data driven method for non-intrusive speech intelligibility estimation. *Proc European Signal Processing Conf, Denmark*, Aug. 2010.
4. N. D. Gaubitch, M. Brookes, P. A. Naylor, and D. Sharma. Bayesian adaptive method for estimating speech intelligibility in noise. *Proc AES Conf on Audio Forensics, Hillerød*, June 2010.
5. J. Berent, P. L. Dragotti, and M. Brookes. Adaptive layer extraction for image based rendering. *Proc IEEE Wkshp on Multimedia Sigal processing*, Rio de Janeiro, Oct. 2009.
6. N. D. Gaubitch, M. Brookes, and P. A. Naylor. Blind channel identification in speech using the long-term average speech spectrum. *Proc European Signal Processing Conf*, Glasgow, Aug. 2009.
7. P. L. Dragotti and M. Brookes. A review of image-based modelling techniques. *Proc SEAS DTC Conference*, July 2009.
8. Wang, Y., Brookes, M. and Dragotti, P. L. "Object Recognition using Multi-view Imaging". *Proc Intl Conf on Signal Processing*, Beijing, October 2008.
9. Emaminejad, A. and Brookes, M. "FEUDOR: Feature Extraction Using Distinctive Octagonal Regions". In *Proc BMVC*, 2008.
10. Dragotti, P. L., Brookes, M. and Wang, Y. "Unsupervised Representation and Understanding of Multi-View Images". In *Proc SEAS DTC Conf*, Edinburgh, June 2008.
11. Cui, J., Gudnason, J. and Brookes, M. "Hidden Markov Model for Multi-Perspective Radar Target Recognition". In *Proc IEEE Radar Conf*, Rome, May 2008.
12. Gudnason, J. and Brookes, M. "Voice source cepstrum coefficients for speaker identification". In *Proc IEEE Intl Conf Acoustics, Speech and Signal Processing*, pages 4821-4824, March 2008. doi: 10.1109/ICASSP.2008.4518736.
13. Khong, A. W. H., Gan, W.-S., Naylor, P. A. and Brookes, M.. "A low complexity fast converging partial update adaptive algorithm employing variable step-size for acoustic echo cancellation". In *Proc IEEE Intl Conf Acoustics, Speech and Signal Processing*, pages 237-240, 2008. doi: 10.1109/ICASSP.2008.4517590.
14. Dragotti, P. L., and Brookes, M. "Efficient Segmentation and Representation of Multi-View Images". In *Proc SEAS DTC Conf*, pages SEN3:1-7, Edinburgh, 2007.
15. Bhunjun, V. & Brookes, M. "Perceptual Gain Function For Eigenspectral Domain Speech Enhancement" *Proc ICASSP*, 2007
16. Chorti, A. & Brookes, D.M. "Resolving Near-Carrier Spectral Infinities Due To 1/F Phase Noise In Oscillators" *Proc ICASSP*, 2007
17. Khong, A. & Brookes, M. "The Effect Of Calibration Errors On Source Localization With Microphone Arrays" *Proc ICASSP*, 2007
18. Naylor, P.; Khong, A. & Brookes, M. "Misalignment Performance Of Selective Tap Adaptive Algorithms For System Identification Of Time-Varying Unknown Systems" *Proc ICASSP*, 2007
19. Bhunjun, V.; Brookes, M. & Naylor, P.A. "Model-based eigenspectrum estimation for speech enhancement", *Proc Asilomar Conf on Signals Systems and Computers*, 2006, TP1.8:1-4
20. Bhunjun, V.; Brookes, M. & Wen, Y.J. "Eigendomain-Based Noise Estimation With The Minimum Statistics Approach", *Proc Intl Wkshp on Acoustic Echo and Noise Control*, 2006
21. Cui, J., Gudnason J. and Brookes, M., "Maximum A-Posteriori Adaptive Masking for Clutter Suppression in Automatic Radar Target Recognition", *Proc IEEE Radar Conf*, pp718-724, 2006
22. Cui, J., Gudnason, J. and Brookes, M., "Radar shadow and Super-resolution features for Automatic Recognition of MSTAR Targets", *IEEE Intl radar conf*, pp534-539, May 2005

23. Cui, J., Gudnason, J. and Brookes, M., "Automatic Recognition of MSTAR Targets using radar shadow and superresolution features", *IEEE ICASSP*, pp 689-592, March 2005
24. Hewavithana, T and Brookes, M., "Blind Adaptive Channel Equalization for OFDM Using the Cyclic Prefix Data", *IEEE Globecom*, Nov 2004
25. Bhunjun, V. and Brookes, M., "Narrowband Noise Estimation in the Subspace Domain", *International Symposium on Intelligent Multimedia, Video & Speech Processing*, Oct 2004
26. T. C. Hewavithana and D. M. Brookes. A Blind Adaptive Channel Equalization Algorithm for OFDM systems. In Proc Intl Wkshp on Signal Processing for Wireless Communications (SPWC), pages 140–144, London, June 2004.
27. Dante, A. & Brookes, M. "Precise real-time outlier removal from motion vector fields for 3D reconstruction", *IEEE Intl Conf on Image Processing*, Sept 2003
28. Bouganis, C.-S. & Brookes, M., "Class-based Multiple Light Detection: An Application to Faces", *Proc British Machine Vision Conference*, Sept 2003
29. Dante, A. and Brookes, M., "Robust multi-body segmentation", *Proc British Machine Vision Conference*, Sept 2003
30. Hewavithana, T.C. & Brookes, M., "Soft Decisions for DQPSK Demodulation for the Viterbi Decoding of Convolutional Codes" - *IEEE ICASSP*, 2003
31. Androutsopoulos, V., Clarke, T.J.W. & Brookes, D. M., "Synthesis and Optimization of Interfaces between Hardware Modules with Incompatible Protocols" *IEEE ISCAS 2003*, May 2003
32. Kounoudes, A., Naylor, P.A. & Brookes, M. "Automatic Epoch Extraction for Closed-Phase Analysis of Speech", *DSP2002 Conference*, Santorini, July 2002
33. Gudnason, J. & Brookes, M., "Distribution Based Classification using Gaussian Mixture Models", *Proc ICASSP*, May 2002.
34. Kounoudes, A., Naylor, P.A. & Brookes, M. "The DYPSA Algorithm for estimation of Glottal closure instants in voiced speech", *Proc ICASSP*, May 2002.
35. Brookes, D.M. and Loke, H.P., "Modelling Energy Flow in the Vocal Tract with Applications to Glottal Closure and Opening Detection", *Proc IEEE ICASSP*, Vol.1, pp.213-216, March 1999.
36. Wiewiorka, A. and D. M. Brookes, "Exponential Interpolation of States in a Hidden Markov Model," *Proc Inst of Acoustics*, vol. 18 Part 9, pp. 201-208, Nov 1996.
37. Shields, D. C. and D. M. Brookes, "Speech Enhancement using a Minimum Mean Square Error Bayesian Estimator," *Proc Inst of Acoustics*, vol. 18 Part 9, pp. 147-154, Nov 1996.
38. Flesch, S. and D. M. Brookes, "Speech recognition using Speaker Dependent Frequency Warping," *Proc Inst of Acoustics*, vol. 18 Part 9, pp. 259-266, Nov 1996.
39. Sanches, I. and D. M. Brookes, "Compensando-se Modelos de Hidden Markov Para O Reconhecimento Automatico de Fala Em Ruído," 13o. *Simposio Brasileiro de Telecomunicacoes*, 6 pp, Aguas de Lindoia, Brasil, Sept 1995.
40. Sanches, I. and D. M. Brookes, "Improved Speech Recognition through the use of Noise-Compensated Hidden Markov Models," *Intl Conf on Signal Processing Applications & Technology*, 5 pp. Boston, Oct 1995.
41. Brookes, D. M. and D. S. F. Chan, "Speaker Characteristics from a Glottal Airflow Model using Robust Inverse Filtering," *Proc Inst of Acoustics*, vol. 16 Part 5, pp. 501-508, November 1994.
42. Ayer, C. M., M. J. Hunt, and D. M. Brookes, "A Discriminatively Derived Linear Transform for Improved Speech Recognition," *Eurospeech*, vol. 1, pp. 583-586, Berlin, Sept 1993.
43. Brookes, D. M., R. I. Harris, and R. J. Wilson, "Archimedes project of the Eureka scheme: the application of digital signal processing to large scale simulation of room acoustics, Part III," *AES Convention*, Paris, 1991.
44. Chan, D. S. F. and D. M. Brookes, "Variability of Excitation Parameters from Robust Closed Phase Glottal Inverse Filtering," *European Conf on Speech Communication & Technology*, pp. 33.1.1 - 33.1.4, Paris, Sept 1989.
45. Howard, D. M., D. M. Brookes, and D. S. F. Chan, "Dynamic Excitation Control in Parallel Formant Speech Synthesis," *FASE88*, vol. 3, pp. 1123-1130, 1988.
46. Brookes, D. M. and P. A. Naylor, "Speech Production Modelling with Variable Glottal Reflection Coefficient," *ICASSP*, vol. S, pp. 671-674, IEEE, New York, 1988.

47. Huckvale, M. A., D. M. Brookes, L. T. Dworkin, M. E. Johnson, D.J. Pearce, and L. Whitaker, "The SPAR Speech Filing System," *European Conf on Speech Technology*, vol. 1, pp. 305-308, Edinburgh, Sept 1987.

PhD/MPhil Theses:

1. A. Emaminejad, PhD thesis, Imperial College London, 2010.
2. Y. Wang. "Object Recognition using Multi-View Imaging", PhD thesis, Imperial College London, 2009.
3. Bhunjun, V, "Subspace-based Enhancement using Eigen-temporal and Eigen-spectral Models", PhD Thesis, University of London, 2007.
4. Gudnason, J, "Voice Source Cepstrum Processing for Speaker Identification", PhD Thesis, university of London, 2007.
5. Cui, J, "Recognition of Stationary and Moving Targets from High Range Resolution Radar Profiles", PhD Thesis, University of London, 2007.
6. Chorti, A., "The Impact of Circuit Nonlinearities and noise in OFDM Receivers", PhD Thesis, University of London, 2005
7. Hewavithana, T. C., "Algorithms for Long Delay Equalization and Soft Decision Decoding in Digital Audio Broadcasting Receivers", PhD Thesis, University of London, 2004
8. Bouganis, C.-S., "Multiple Light Souce Detection with Application to Face Recognition", PhD Thesis, University of London, 2004
9. Dante, A, "Real-Time Distance Estimation and 3D Scene Reconstruction From Image Sequences", PhD Thesis, University of London, 2004
10. Barnes, H., "Speech Enhancement using Microphone Arrays", PhD Thesis, University of London, 2004
11. Shields, D.C., "Speech Enhancement using Bayesian Estimation with Signal Dependent Prior Distributions", MPhil Thesis, University of London, 2001
12. Alexopoulos, K., "Phase Spectral Representation for Low Bit-Rate Speech Coding", PhD Thesis, University of London, 2001
13. Wiewiorka, A., "Speech Recognition using Hidden Markov Models with Exponential Interpolation of State Parameters", 1997
14. Wilson, R. J., "Noise Source Cancellation in Audio Recordings", PhD Thesis, University of London, 1997.
15. Chan, D. S. F., "Speech Production Modelling based on Glottal Inverse Filtering," PhD Thesis, University of London, 1994.
16. Sanches, I., "Improved Speech Recognition Through the use of Noise-Compensated Hidden Markov Models", PhD Thesis, University of London, 1994.
17. Ayer, C. M., "A Discriminatively Derived Linear Transform Capable of Improving Speech Recognition Accuracy," PhD Thesis, London University, 1992.
18. Naylor, P. A., "A Model of Voiced Speech Production Incorporating Source-Tract Interaction and its Application to Speech Analysis and Synthesis," PhD Thesis, London University, 1990.

External Examining

1. External Examiner: Cambridge University, Engineering Dept – Part IIA, 2006 – 2009
2. External Examiner: University College London, Phonetics & Linguistics Dept, 1987-1991

PhD Examining

1. PhD: Siti Shafie, , Imperial College London, 2011
2. PhD: Justin Wong, , Imperial College London, 2011
3. PhD: Mai Xu, "3D Scene Interpretation with the Tower of Knowledge", Imperial College London, 2010
4. PhD: Mark Thomas, "Glottal-Synchronous Speech Processing", Imperial College London, 2010
5. PhD: Varit Chaisinthop, "Centralized and Distributed Semi-Parametric Compression of Piecewise Smooth Functions", Imperial College London, 2010

6. PhD: Chandra Raut, "Discriminative Adaptive Training and Bayesian Inference for Speech Recognition", Cambridge University, 2010
7. PhD: Jimi Wen: "Reverberation: Models, Estimation and Applications", Imperial College London, 2009
8. PhD: Georgios Tzimiropoulos: "A fast gradient-based approach to image template matching", Imperial College London, 2009
9. PhD: Qiang Liu: "Data Reuse and Parallelism in hardware compilation", Imperial College London, 2008
10. PhD: Andreas Varnevas: "Signal Processing Methods for EEG Data Classification", Imperial College London, 2008
11. PhD: Arantza del Pozo: "Voice Source and Duration Modelling for Voice Conversion and Speech Repair", University of Cambridge, 2008
12. PhD: Christina Orphanidou: "Voice Morphing", University of Oxford, 2007
13. PhD: Alastair Smith: "Heterogeneous Reconfigurable Architecture Design: An Optimisation Approach", Imperial College London, 2007
14. PhD: Pancham Shukla: "Sampling Schemes for Multidimensional Nonbandlimited Signals", Imperial College London, 2007
15. PhD: Nicolas Chetry: "Computer Models for Musical Instrument Identification", Queen Mary, Univ of London, 2006
16. PhD: Khe Chai Sim: "Structured Precision Matrix Modelling for Speech Recognition", Univ of Cambridge, 2006
17. PhD: Nina Thornhill: "Detection and Diagnosis of Distributed Disturbances in Chemical Processes", University College London, 2005
18. PhD: Andy Khong: "Adaptive Algorithms Employing Tap Selection for Single Channel and Stereophonic Acoustic Echo Cancellation", Imperial College, 2005
19. PhD: Daniel Povey: "Discriminative Training for Large Vocabulary Speech Recognition", Cambridge University, 2004
20. PhD: Henry Styles: "Compilation and Modelling of Reconfigurable Data Systems", Dept of Computing, Imperial College, 2004

Lecturing

1. "Analysis of Circuits" – Ug1 course, 2008-
2. "Information Theory" – Ug4/MSc course, 2003-2007
3. "Real-Time Digital Signal Processing" – Ug3/MSc course, 1997-1999
4. "Speech Processing" – Ug4/MSc course, 1994-2000
5. "Digital Circuits II" – Ug2, 1991-2010
6. "Electrical Engineering" – Ug1, 1984-1992

Awards

1. Engineering Faculty Teaching Award 2010

External Professional Activities

1. TPC member EUSIPCO 2011
2. Track Chair EUSIPCO 2008