

Curriculum Vitae

Name: Jonathan George Campbell.
URL: <http://www.jgcampbell.com>

Degrees: BA, BAI (1972) (Electronic Eng.) II.1, Trinity College, Dublin.
DPhil, University of Ulster, 2000

Professional Societies: IEEE, Irish Pattern Recognition & Classification Society,
British Machine Vision Association, Irish Mathematical Society

Current Position

2001– Lecturer in Computing, Letterkenny Institute of Technology, Letterkenny, Co. Donegal, Ireland.

Research interests & expertise : pattern recognition and machine learning, image processing, signal processing, software engineering.

Summary of Past Positions

1999–2001 Lecturer in Computer Science, School of Computer Science, **Queen’s University Belfast**, Belfast, BT7 1NN. Founder member of **Image and Vision Systems Centre**; management committee of Sonic Arts Research Centre. Teaching: Algorithms & data structures, computer architecture, PgDip dissertations.

1989–1999 Lecturer in Computer Science, School of Information and Software Engineering, **University of Ulster**, Magee College, Londonderry, BT48 7JL.

1981–1989: Computer Applied Techniques Ltd., Malahide, Ireland.

Senior Engineer/Consultant: Software, scientific, avionics and aerospace consultancy, research and development.

1980–1981: An Foras Forbartha, Dublin 4, Ireland.

Contract Researcher: Space-borne remote sensing and image processing applied to land-use mapping.

1973–1980: Plessey Electronic Systems Research, Havant, U.K.

Assistant Engineer–Principal Engineer, Research and Development: Pattern recognition, image processing, signal processing, modelling simulation and mathematical analysis of electronic systems, programming, embedded computer systems, radar systems, project management.

1973: Digital Equipment Corporation, Galway, Ireland. **Technician/Engineer**, PDP-11 production plant.

External Professional Activities

Founder-member of Irish Pattern Recognition & Classification Society; referee for numerous academic journals: Fuzzy Sets and Systems, Pattern Analysis and Applications, Measurement Science and Technology (Institute of Physics), Int. J. Remote Sensing, Neurocomputing, Artificial Intelligence Review, The Computer Journal; programme Committee for IMVIP conferences.

External Examiner, Phd and MSc dissertations, School of Computer Science, National University of Ireland Maynooth; MSc dissertations, Dublin City University.

Detailed Employment History

2001– Lecturer in Computer Science, Letterkenny Institute of Technology, Letterkenny, Co. Donegal, Ireland.

Research interests & expertise : pattern recognition and machine learning, image processing, signal processing, software engineering. Group leader of *Pattern Recognition and Machine Learning (PRML)* group.

Teaching interests & activities: image processing, games programming, computer graphics, computer architecture and operating systems, programming, final year dissertations.

Grants

- InterTrade Ireland FUSION project with Opt2Vote Ltd., Derry (2005–2007): *Improved methods for automatic ballot paper counting*.
- HEA Strand I Science and Technology grant (2004–2007): *Machine Vision for Identification of Shellfish Larvae*. Postgraduate student: Christopher Hudy.

External Technical Activities

- Founder-member of Irish Pattern Recognition & Classification Society;
- Referee for numerous academic journals: Fuzzy Sets and Systems, Pattern Analysis and Applications, Measurement Science and Technology (Institute of Physics), Int. J. Remote Sensing, Neurocomputing, Artificial Intelligence Review, The Computer Journal;
- Programme Committee for IMVIP 2007 – National University of Ireland, Maynooth, September 2007;
- Programme Committee for IMVIP 2006 – 10th Irish Machine Vision and Image Processing Conference, Dublin City University, August 2006;
- Programme Committee for IMVIP 2005 – 9th Irish Machine Vision and Image Processing Conference, Queen’s University Belfast, August 2005;
- Programme Committee for IMVIP 2004 – 8th Irish Machine Vision and Image Processing Conference, Trinity College, Dublin, September 2004;
- Programme Committee for IMVIP 2003 – 7th Irish Machine Vision and Image Processing Conference, University of Ulster, Coleraine, September 2003;
- External Examiner, Phd and MSc dissertations, School of Computer Science, National University of Ireland Maynooth;
- Programme Committee for IMVIP 2001 – 5th Irish Machine Vision and Image Processing Conference, National University of Ireland Maynooth, September 2001;
- Programme Committee for MVIP 2001 – Iranian Machine Vision and Image Processing Conference, University of Birjand, Iran, March 2001.
- Programme Committee and Local Organising Committee for IMVIP 2000 – 4th Irish Machine Vision and Image Processing Conference, The Queen’s University of Belfast, September 2000.
- Programme Committee 3rd Irish Machine Vision and Image Processing Conference, Dublin City University, September 1999.
- Programme Committee CSNLP-8, The Eighth International Workshop on the Cognitive Science of Natural Language Processing, National University of Ireland, Galway, August 1999.
- Programme Committee Optical Engineering Society of Ireland & Irish Machine Vision and Image Processing Joint Conference, National University of Ireland, Maynooth, September 1998.
- Committee member Optical Engineering Society of Ireland (1995–96).

- Programme Co-chair: IMVIP '97/ AI-97 (Irish Machine Vision and Image Processing and Irish Artificial Intelligence Joint conferences, Magee College, University of Ulster, September 1997).
- Organising Committee Irish Signals and Systems Conference, Magee College, University of Ulster, June 1997.

Sporting and Community Activities: Webmaster, Finn Valley Athletics Club.

1999–2001 Lecturer, School of Computer Science, Queen’s University Belfast, Belfast, BT7 1NN.

Research interests & activities: Image processing, pattern recognition, automated inspection, signal processing, fuzzy systems, neural networks, software engineering.

Consultancy Projects and Grants

- Management committee, Sonic Arts Research Centre, Schools of Music, Computer Science, and Electronic Engineering, QUB; £4.5 m. SPUR grant.
- Teaching Company Scheme Programme between Kelman Ltd. and Schools of C.S. and Chemistry, Q.U.B. ”Development of Novel Tensiograph Technique for the Determination of Dissolved Gas in Transformer Oil”.
- EU 5th Framework Project AQUA-STEW (Development of Optical Sensing Techniques for Water Quality Determination). Partners: School of C.S., Q.U.B.; Kelman Ltd. Lisburn; Physics, University College Dublin; Carlow Institute of Technology; Liverpool John Moores University; Kingston University; IRH, Nancy, France (Prime).

1989–1999 Lecturer in Computer Science, School of Information and Software Engineering, University of Ulster, Magee College, Londonderry, BT48 7JL.

Research interests & activities: Image processing, pattern recognition, automated inspection, signal processing, fuzzy systems, neural networks, software engineering. Founder member and group-leader of **Signal and Image Processing** research group. Developer and maintainer of the **DataLab** software signal and image processing laboratory.

Teaching experience: Image processing, software engineering, programming, object-oriented programming, computer architecture & organisation, comparative programming languages, systems analysis, human-computer-interaction. Dissertation supervision. Dissertations Coordinator for MSc in Computing and Information Systems.

Joint-coordinator of course development, BEng. in Electronics and Computing, joint degree Faculties of Informatics and Engineering (new in 1995).

Consultancy Projects: Machine inspection of yarn manufacturing process (Dupont Lycra, May-down, Londonderry), Person recognition and authentication via face images (CEM, Belfast), machine inspection of printed-circuit-boards (Digital Equipment Corp., Galway), signal processing for ground probing radar (Bord-Na-Mona), software project cost estimation (LM. Ericsson Company).

Doctoral Supervision: Two students 1994–1996.

1981-1989 Senior Engineer/Consultant, Computer Applied Techniques Ltd., James' Terrace, Malahide, Co. Dublin.

General Duties

Software, scientific, avionics and aerospace consultancy, research and development. Information technology consultancy to business.

Authored and co-authored numerous unpublished technical reports during this period.

Major projects and work experience

- Development of attitude & orbit control software for European Space Agency ISO satellite: project management, software engineering, Ada, software quality assurance.
- Definition of the calibration process for the European Space Agency HIPPARCOS astrometry satellite: project management, mathematical analysis, modelling and simulation. Preparation of software requirements document for HIPPARCOS calibration operational software.
- Seconded to MATRA Espace, Toulouse, France, Jan.-Mar. 1982.
- Development of interactive signal processing software for Personal Computer.
- Simulation study of satellite systems to monitor the Earth's Radiation Budget for ESA.
- Development of software for microcomputer terminal emulation.
- Introduction of hand-held data capture terminals to retail and distributive trades.
- Development of a computer simulation model of an optical sensing instrument for ESA.
- Preparation of a COBOL programmers manual.

1980-1981 Contract Researcher: An Foras Forbatha, Waterloo Road, Dublin.

Employed on a one year contract to study the feasibility of automated land-use mapping using computer analysis of digital multispectral satellite imagery.

1973-1980 Assistant-Principal Engineer, Mathematics Department, Plessey Electronic Systems Research, Havant, Hampshire, United Kingdom.

General Duties:

- Contract research and consultancy for corporate and government customers in the areas of computer modelling of electronic systems, digital signal processing, image processing, automatic pattern recognition.
- Programming assistance and advice for engineers and scientists engaged in research and development of electronic sensors and signal processing equipment.
- Mathematical/analytical assistance for engineers and scientists.

Authored a large number of technical reports (classified and otherwise unpublished) during this period.

Specific project and work experience:

- Simulation and assessment of a proposed microwave landing guidance system for the Civil Aviation Authority. This involved the construction of a large software model to simulate both the ground equipment – an electronically scanned phased array antenna – and the aircraft signal processing equipment.
- Study of the application of statistical pattern recognition methods to radar signal processing: pattern recognition, signal processing. Study of the human-computer-interface – computer graphics.

- Software development for an embedded microcomputer controlled radiometer data gathering equipment (one of first European users of Intel 8080).
- Software and hardware interfacing of various analogue and digital equipment to a range of minicomputers.
- Development of interactive software systems for:
 - digital signal processing
 - statistical pattern recognition
 - digital picture processing.
- Analogue image processing.
- Adaptive antennas.

1973 Engineer, Digital Equipment Corporation, Galway.

Publications

References

- [1] Christopher Hudy, Jonathan Campbell, and John Slater. Contour based methods for segmentation of low contrast images. In Derek Molloy, Ovidiu Ghita, and Robert Sadleir, editors, *Proceedings IMVIP 2006, Irish Machine Vision and Image Processing Conference 2006*, pages 138–145, Dublin City University, Dublin, Ireland, August 2006.
- [2] Jonathan Campbell, John Slater, John Gillespie, Ivan Bendezu, and Fionn Murtagh. Pattern recognition methods for identification of shellfish larvae. In *Proceedings IMVIP 2005, Irish Machine Vision and Image Processing Conference 2005*, pages 97–104, The Queen’s University of Belfast, Belfast, Northern Ireland, U.K., August 2005. Available at: <http://www.jgcampbell.com/mvisl/imvip05.pdf>.
- [3] Christopher Hudy, Jonathan Campbell, and John Slater. Segmentation methods for optical microscopy images — a practical survey. In *Proceedings IMVIP 2005, Irish Machine Vision and Image Processing Conference 2005*, page 247, The Queen’s University of Belfast, Belfast, Northern Ireland, U.K., August 2005. Available at: <http://www.jgcampbell.com/mvisl/imvip05Post.pdf>.
- [4] Vitorino Ramos, Jonathan Campbell, John Slater, John Gillespie, Ivan Bendezu, and Fionn Murtagh. Swarming around shellfish larvae. In *Proceedings 2nd World Congress on Lateral Computing*, pages 97–104, Bangalore, India, December 2005. Springer-Verlag, LNCS Series.
- [5] Jonathan Campbell, John Slater, John Gillespie, Ivan Bendezu, and Fionn Murtagh. Pattern recognition methods for the identification of bivalve larvae. *Poster Presented at Bionet03, Galway, December 2003*, 2003.
- [6] Jonathan G. Campbell and Fionn Murtagh and M. Köküer. Graduate and professional development in imaging and optical signal processing, and related fields. In W.J. Blau, J.F. Donegan, A.F. Duke, B.D. MacCraith, J.A. McLaughlin, N.D. McMillan, G.M. O’Connor, E. O’Mongain, and V. Toal, editors, *Opto-Ireland 2002: Optics and Photonics Technologies and Applications*, pages 1312–1320. SPIE, 2003.
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- [8] M. Köküer, J. G. Campbell, F. Murtagh, and J. L. Starck. Wavelet- and entropy-based data modeling. In K. T. V. Grattan and S. H. Khan, editors, *Sensors and Their Applications XI*, pages 215–220. Institute of Physics Publishing, 2001.
- [9] M. Köküer, J. G. Campbell, and F. Murtagh. Datalab-j: a signal and image processing laboratory. In K. T. V. Grattan and S. H. Khan, editors, *Sensors and Their Applications XI*, pages 409–415. Institute of Physics Publishing, 2001.
- [10] J.G. Campbell. Review of “Dynamic Vision: From Images to Face Recognition”, by Shaogang Gong, Stephen J. McKenna, Alexandra Psarrou, Imperial College Press (London, England), 2000. *Artificial Intelligence Review*, 14(6):619–621, December 2000.
- [11] J.G. Campbell and F.D. Murtagh, editors. *Proceedings of IMVIP 2000, Irish Machine Vision and Image Processing Conference 2000*, The Queen’s University of Belfast, Belfast, Northern Ireland, U.K., August 2000.
- [12] F. Murtagh, A. Bouridane, M. Nibouche, A. Alexander, D. Crookes, J.G. Campbell, J.L. Starck, and Z. Geradts. Multiresolution and fractal methods for content based image retrieval. In Campbell and Murtagh [11], pages 175–183.
- [13] J.G. Campbell, C. Frawley, D. Stanford, F. Murtagh, and A. E. Raftery. Linear Flaw Detection in Woven Textiles using Model-Based Clustering. *International Journal of Imaging Systems and Technology*, 10:339–346, 1999.
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