# Curriculum Vitae

## Professor Graham Kendall, BSc, PhD, FORS

## Personal Details

EMAIL:       graham.kendall@nottingham.edu.my
URL:         http://graham-kendall.com
Nationality:   British

## University Education and Qualifications

1994-1997    BSc (Hons) First Class in Computation from University of Manchester Institute of Science and Technology (UMIST)

1997-2000    PhD awarded from the School of Computer Science and Information Technology at the University of Nottingham under the supervision of Prof. Edmund Burke. Viva date: 1$^{st}$ Dec 2000. Graduation date: 4$^{th}$ July 2001. Thesis title: *Applying Meta-Heuristic Algorithms to the Nesting Problem Utilising the No Fit Polygon.*

## CV Summary

### Academic Publications

- Over 50 Refereed Journal Papers (all but 2 in ISI ranked journals), over 100 Refereed Conference Papers
- 10 book chapters
- Editor of 12 books

### Funding

- Awarded over £7M of external research funding

### Recent Esteem Indicators

- Member of the EPSRC Peer Review College (2003-2005, 2006-2009, 2010-present)
- Associate editor or editorial board member of 8 international journals
- Member of over 150 programme/technical committees for international conferences since 2000
- Chair of the MISTA (Multidisciplinary International Conference on Scheduling : Theory and Applications) series of conferences (2003-present)

### Teaching and Supervision

- Supervisor of 7 current PhD students. I have supervised 20 PhD students to completion
- Have taught a variety of subjects, both at my own institution and internationally
- Invited international lecturer in Germany for 6 years, Belgium for 4 years and Egypt for 8 years
- Supervised the best 3$^{rd}$ year project dissertation for the 3 consecutive years
- Consistently receive very positive student feedback

### External Examining

- Externally examined 25 PhD students (12 of these were international)
- External examiner to a Malaysian university (2008-present)
- External examiner to the University of Essex (2008/09-2011/12)
- Established an ongoing, international collaboration with a private university in Cairo, Egypt

### Industrial Activity

- Director of three companies: Aptia Solutions Ltd. and EventMap Ltd. and MyRIAD Solutions Sdn Bhd

# CV Contents

# 1.   Career History

My career has followed two distinct paths. For 17 years I worked in the IT industry, acting in a variety of managerial roles, managing upwards of 70 people.

In 1994, I began an academic career, resulting in me securing a Chair at the University of Nottingham in 2007.

My complete career history is shown below.

## Position: Vice Provost (Research and Knowledge Transfer)

Employer:          University of Nottingham, Malaysia Campus (UNMC)
Start Date:          $1^{st}$ August 2011
End Date:          present
Responsibilities: Strategic direction of UNMC with respect to research and knowledge transfer

This is a three year secondment. I will return to my previous position in July 2014.

## Position: Professor

Employer:          University of Nottingham, UK
Start Date:          $1^{st}$ January 2007
End Date:          present
Responsibilities: Research, teaching and administration to the level expected from a Professor in a Russell Group University.

I also hold an Adjunct Professor position at MISR International University (July 2010 to present).

## Position: Associate Professor and Reader

Employer:          University of Nottingham, UK
Start Date:          $1^{st}$ August 2005
End Date:          $31^{st}$ December 2006
Responsibilities: Research, teaching and administration to the level expected at a Russell Group University.

## Position: Senior Lecturer

Employer:          University of Nottingham, UK
Start Date:          $1^{st}$ August 2003
End Date:          $31^{st}$ July 2005
Responsibilities: Research, teaching and administration to the level expected at a Russell Group University.

## Position: Lecturer

Employer:          University of Nottingham, UK
Start Date:          $1^{st}$ September 1999
End Date:          $31^{st}$ July 2003
Responsibilities: Research, teaching and administration to the level expected at a Russell Group University.

## Position: Operations Support Manager

Employer:          Provincial Insurance, Kendal, Cumbria
Start Date:          3rd May 1988
End Date:          20th September 1994
Responsibilities: I was responsible for a team of seven Operations Analysts. The role of the team was to implement and support production systems (including overnight call out). We also provided a technical advisory service to other departments within the company.

## Position: SCL (System Control Language) Support Technician

Employer:          CWS Computer Services, Manchester
Start Date:          17 August 1987
End Date:          29th April 1988

Responsibilities: My main tasks were writing of SCL (VME's job control language), supporting the operations section with production problems, providing out of hours support for operational aspects of the application systems, handing systems over once they had been written and quality assurance tests had been successfully completed.

## Position: JCL (Job Control Language) Technical Support Manager

Employer:                    CWS Computer Services, Manchester
Start Date:                  04 August 1986
End Date:                    17 August 1987
Responsibilities: My team (5 Operations Analysts) were responsible for providing a support and development service to the two ICL 2966 mainframes which were running George 3.

I was also responsible for supporting the ICL George 2 sites which were based in Bedworth and Woolwich.

## Position: Remote Job Entry Service Manager

Employer:                    CWS Computer Services, Salford
Start Date:                  11 June 1985
End Date:                    04 August 1986
Responsibilities: My main responsibility was to implement a Remote Job Entry Service consisting of workloads which were previously run on the bureaux machines at Glasgow, Ipswich, Gateshead and Manchester. The work was being run under the George 2 operating system and was to be implemented onto the George 3 operating system.

I was chosen for this task because of my knowledge of the current work load, my technical knowledge of the George 2 operating system, my management skills, my contacts within the company and my ability to learn new technologies quickly.
I managed about 70 people and four mainframes.

## Position: Production Manager

Employer:                    CWS Computer Services, Woolwich
Start Date:                  5 April 1982
End Date:                    11 June 1985
Responsibilities: I was responsible for 12 people: 1 Technical Support Officer, 1 Customer Liaison Officer, 2 Shift Supervisors and 8 Computer Operators.

My role was to provide a quality service to our customers which used our machine on a bureau basis. This included planning schedules, interpreting customer requirements, working with sales and support staff etc.

## Previous positions to the ones above are summarised below.

**Shift Supervisor for CWS Computer Services** (1981-1982): Using ICL equipment I was responsible for running a shift of five people. My prime responsibility was to ensure work was processed on the computer efficiently and correctly.

**Computer Operator for Cornhill Insurance** (1980-1981): This position involved general operator duties of loading discs, paper etc.

**Senior Computer Operator for CWS Computer Services** (1977-1980): This position, as well as general senior operator duties, also included a large amount of George 2 macro writing (1977-1980)

# 2. Publications

Due to research group policy, the majority of my papers are listed in alphabetical order

## 2.1. Refereed Journal Publications

### In Press

1. Bai, R; Blazewicz, J; Burke, E. K; Kendall, G and McCollum, B *A Simulated Annealing Hyper-heuristic Methodology for Flexible Decision Support*. **4OR - A Quarterly Journal of Operations Research**, in press.
   ISI Impact Factor (2010): **0.690**

2. Blazewicz, J; Burke, E. K; Kendall, G; Mruczkiewicz, W; Öguz, C and Swiercz, A *A hyper-heuristic approach to sequencing by hybridization of DNA sequences*. **Annals of Operations Research**, in press.
   ISI Impact Factor (2010): **0.675**

3. Burke, E. K; Hyde, M. R and Kendall, G *Grammatical Evolution of Local Search Heuristics*. **IEEE Transactions on Evolutionary Computation**, in press.
   ISI Impact Factor (2010): 4.371

4. Burke, E. K; Kendall, G; Misir, M and Özcan, E *Monte Carlo hyper-heuristics for examination timetabling*. **Annals of Operations Research**, in press.
   ISI Impact Factor (2010): **0.675**

5. Li, J; Davies, G.D; Kendall, G; Soane, E; Bai, R; Rocks, S.A and Pollard, S.J.T **Evidence and belief in regulatory decisions – Incorporating expected utility into decision modelling**. *Expert Systems with Applications*, in press.
   ISI Impact Factor (2010): 1.926

6. Sabar, N. R; Ayob, M; Qu, R and Kendall, G A **Graph Coloring Constructive Hyper-Heuristic for Examination Timetabling Problems**. *Applied Intelligence*, in press.
   ISI Impact Factor (2010): 0.881

7. Swan, J; Ochoa, G; Kendall, G and Edjvet, M **Fitness Landscapes and the Andrews-Curtis Conjecture**. *International Journal of Algebra and Computation*, in press.
   ISI Impact Factor (2010): 0.537

### 2012

8. Bai, R; Kendall, G; Qu, R and Atkin, J (2012) *Tabu assisted guided local search approaches for freight service network design*. **Information Sciences**, 189: 266-281, 2012.
   ISI Impact Factor (2010): 2.836

9. Burke, E.K; Hyde, M; Kendall, G and Woodward, J (2012) *Automating the Packing Heuristic Design Process with Genetic Programming*. **Evolutionary Computation**, 20 (1): 63-89, 2012.
   ISI Impact Factor (2010): 2.630

   Sabar, N. R; Ayob, M; Kendall, G and Qu, R (2012) *A honey-bee mating optimization algorithm for educational timetabling problems*. **European Journal of Operational Research**, 216 (3): 533-543, 2012.

   ISI Impact Factor (2010): 2.158

### 2011

10. Allen S. D, E.K. Burke and Kendall G. (2011) *A hybrid placement strategy for the three-dimensional strip packing problem*, **European Journal of Operational Research**, 209(3): 219-227 (10.1016/j.ejor.2010.09.023)
    ISI Impact Factor (2009): **2.093**

11. Bak S., Blazewicz J, Pawlak G, Plaza M, Burke E.K. and Kendall G. (2011) *A Parallel Branch and Bound Approach to the Rectangular Guillotine Strip Cutting Problem*, **INFORMS Journal on Computing**, 23 (1): 15-25, 2011 (doi:10.1287/ijoc.1100.0394)

ISI Impact Factor (2009): **1.318**

12. Burke E. K., Hyde M. R. and Kendall G. (2011) *A Squeaky Wheel Optimisation Methodology for Two Dimensional Strip Packing*, **Computer & Operations Research**, 38(7): 1035-1044

    ISI Impact Factor (2009): **2.116**

13. Li, J; Hingston, P and Kendall, G (2011) *Engineering Design of Strategies for Winning Iterated Prisoner's Dilemma Competitions*. **IEEE Transactions on Computational Intelligence and AI in Games**, 3 (4): 348-360, 2011.


## 2010

14. Bai R., Burke E.K., Kendall G., Li J. and McCollum B. (2010) *A Hybrid Evolutionary Approach to the Nurse Rostering Problem*, **IEEE Transactions on Evolutionary Computation**, 14(4): 580-590 (doi:10.1109/TEVC.2009.2033583)

    ISI Impact Factor (2009): **4.589**

15. Binner J.M., Tino P., Tepper J., Anderson R., Jones B., and Kendall G. (2010) *Does money matter in inflation forecasting?*, **Physica A: Statistical Mechanics and its Applications**, 389(21):4793-4808 (doi:10.1016/j.physa.2010.06.015)

    ISI Impact Factor (2009): **1.562**

16. Burke E.K., Hellier R., Kendall G. and Whitwell G. *Irregular Packing using the Line and Arc No-Fit Polygon*, **Operations Research**, , 58(4), part 1: 948-970 (doi:10.1287/opre.1090.0770)

    ISI Impact Factor (2008): **1.576**

17. Burke E. K., Hyde M., Kendall G. and Woodward J. *A Genetic Programming Hyper-Heuristic Approach for Evolving 2-Dimensional Strip Packing Heuristics*, **IEEE Transactions on Evolutionary Computation**, 14(6): 942-958, 2010

    ISI Impact Factor (2009): **4.589**

18. Davies G.J., Kendall G., Soane E., Li J., Charnley F. and Pollard S.J.T. (2010) *Regulators as 'agents': power and personality in risk regulation and a role for agent-based simulation*. **Journal of Risk Research**, 13(8):961-982 (doi: 10.1080/13669877.2010.486075)

    ISI Impact Factor (2009): **0.569**

19. Kahar M.N.M. and Kendall G. (2010) *The examination timetabling problem at Universiti Malaysia Pahang: Comparison of a constructive heuristic with an existing software solution*, **European Journal of Operational Research**, 207(2): 557-565 (doi:10.1016/j.ejor.2010.04.011)

    ISI Impact Factor (2009): **2.093**

20. Kendall G., Knust S., Ribeiro C. C. and Urrutia S. (2010) *Scheduling in Sports: An Annotated Bibliography*. **Computers & Operations Research**, 37: 1-19 (doi:10.1016/j.cor.2009.05.013)

    ISI Impact Factor (2009): **2.116**

21. Li J. and Kendall G. (2010) *Collective behaviour and kin selection in evolutionary iterated Prisoners' Dilemma*, **Journal of Multiple-Valued Logic and Soft Computing**, 16(6): 509-525

    ISI Impact Factor (2009): **0.343**

22. Yang S., Wang D., Chai T. and Kendall G. (2010) *An Improved Constraint Satisfaction Adaptive Neural Network for Job-Shop Scheduling*. **Journal of Scheduling**, 13(1):17-38 (doi:10.1007/s10951-009-0106-z)

    ISI Impact Factor (2009): **1.265**


## 2009

23. Ayob M. and Kendall G. (2009) *The Optimisation of the Single Surface Mount Device Placement Machine in Printed Circuit Board Assembly: A Survey*. **International Journal of Systems Science**, 40(6): 553-569 (doi:10.1080/00207720902777964)

    ISI Impact Factor (2009): **0.918**

24. Barteczko-Hibbert C., Gillott M. and Kendall G. (2009) *An Artificial Neural Network for Predicting Domestic Hot Water Characteristics*. **International Journal of Low-Carbon Technologies**, 4(2):112-119 (doi:10.1093/ijlct/ctp010)

25. Binner J. M., Gazely A. M., and Kendall G. *An Evaluation of UK Risky Money: An Artificial Intelligence Approach.* **Global Business and Economics Review**, 11(1):1-18

26. Burke E. K., Kendall G., and Whitwell G. (2009) *A Simulated Annealing Enhancement of the Best-Fit Heuristic for the Orthogonal Stock Cutting Problem.* **INFORMS Journal on Computing**, 21(3):505-516 (doi:10.1287/ijoc.1080.0306)

    ISI Impact Factor (2009): **1.318**

27. Li J. and Kendall. (2009) *A Strategy with Novel Evolutionary Features for Iterated Prisoners Dilemma.* **Evolutionary Computation**, 17(2): 257–274 (doi:10.1162/evco.2009.17.2.257)

    ISI Impact Factor (2009): **3.103**

28. Li J., Pollard S., Kendall G., Soane E. and Davies G. (2009) *Optimising Risk Reduction: An Expected Utility Approach of Cost-Benefit Analysis for Regulatory Decision Making under Risk*, **Reliability Engineering and System Safety**, 94(11):1729-1734 (doi:10.1016/j.ress.2009.05.005)

    ISI Impact Factor (2009): **1.908**

## 2008

29. Ayob M. and Kendall G. (2008) *A Survey of Surface Mount Device Placement Machine Optimisation: Machine Classification.* **European Journal of Operational Research**, 186(3), 893-914 (doi:10.1016/j.ejor.2007.03.042)

    ISI Impact Factor (2009): **2.093**

30. Bai R., Burke E.K. and Kendall G. (2008) *Heuristic, Meta-heuristic and Hyper-heuristic Approaches for Fresh Produce Inventory Control and Shelf Space Allocation.* **Journal of the Operational Research Society**, 59(10), 1387-1397 (doi:10.1057/palgrave.jors.2602463)

    ISI Impact Factor (2009): **1.009**

31. Bai R. and Kendall G. (2008) *A Model for Fresh Produce Shelf Space Allocation and Inventory Management with Freshness Condition Dependent Demand.* **INFORMS Journal on Computing**, 20(1), 78-85 (doi:10.1287/ijoc.1070.0219)

    ISI Impact Factor (2009): **1.318**

32. Binner J.M., Gazely A.M. and Kendall G. (2008) *Evaluating the Performance of a EuroDivisia Index Using Artificial Intelligence Techniques*. **International Journal of Automation and Computing**, 5(1), 58-62 (doi:10.1007/s11633-008-0058-3)

33. Kendall G. (2008) *Scheduling English Football Fixtures Over Holiday Periods*. **Journal of the Operational Research Society**, 59(6), 743-755 (doi:10.1057/palgrave.jors.2602382)

    ISI Impact Factor (2009): **1.009**

34. Kendall G., Parkes A. and Spoerer K. (2008) *A Survey of NP-Complete Puzzles*. **International Computer Games Association Journal**, 31(1), 13-34

35. Oates R., Kendall G. and Garibaldi J. (2008) *Frequency Analysis for Dendritic Cell Population Tuning*. **Evolutionary Intelligence**, 1(2), 145-157 (doi:10.1007/s12065-008-0011-y)

36. Petrovic S., Fayad C, Petrovic D, Burke E. K., Kendall G. (2008) *Fuzzy Job Shop Scheduling with Lot-sizing*, **Annals of Operations Research**, 159(1), 275-292 (doi:10.1007/s10479-007-0287-9)

    ISI Impact Factor (2009): **0.961**

## 2007

37. Burke E.K., Hellier R.S.R., Kendall G. and Whitwell. (2007) *Complete and Robust No-Fit Polygon Generation for the Irregular Stock Cutting Problem*. **European Journal of Operational Research**, 179(1), 27-49 (doi:10.1016/j.ejor.2006.03.011)

    ISI Impact Factor (2009): **2.093**

38. Dowsland K.A., Gilbert M and Kendall G. (2007) *A Local Search Approach to a Circle Cutting Problem Arising in the Motor Cycle Industry*. **Journal of the Operational Research Society**, 2007, 58, 429-438 (doi:10.1057/palgrave.jors.2602170)

ISI Impact Factor (2009): **1.009**

39. Kendall G. and Su Y. (2007) *Imperfect Evolutionary Systems.* **IEEE Transactions on Evolutionary Computation**, 2007, 11(3), 294-307 (doi:10.1109/TEVC.2006.887348)

    ISI Impact Factor (2009): **4.589**

40. Terrazas G., Siepman P., Kendall G. and Krasnogor N. (2007) An Evolutionary Methodology for the Automated Design of Cellular Automaton-based Complex Systems. **Journal of Cellular Automata**, 2(1), 77-102

    ISI Impact Factor (2009): **0.325**


## 2006

41. Burke E.K., Hellier R.S.R., Kendall G. and Whitwell. (2006) *A New Bottom-Left-fill Heuristic Algorithm for the Two-Dimensional Irregular Packing Problem.* **Operations Research**, 54(3), 587-601 (doi:10.1287/opre.1060.0293)

    ISI Impact Factor (2009): **1.576**

42. Dowsland K., Herbert E., Kendall G. and Burke E.K. (2006) *Using Tree Search Bounds to Enhance a Genetic Algorithm Approach to Two Rectangle Packing Problems.* **European Journal of Operational Research**, 168(2), 390-402 (doi:10.1016/j.ejor.2004.04.030)

    ISI Impact Factor (2009): **2.093**

43. Lucas S.M. and Kendall G. (2006) *Evolutionary Computation and Games* (invited review). **IEEE Computational Intelligence Magazine**. 1(1), 10-18 (doi:10.1109/MCI.2006.1597057)

    ISI Impact Factor (2009): **2.622**


## 2005

44. Ayob M., Kendall G. (2005) *A Triple Objective Function with a Chebychev Dynamic Pick-and-place Point Specification Approach to Optimise the Surface Mount Placement Machine.* **European Journal of Operational Research**, 164(3), 609-626 (doi:10.1016/j.ejor.2003.09.034)

    ISI Impact Factor (2009): **2.093**


## 2004

45. Binner J., Kendall G. and Gazely A. (2004) *Evolving Neural Networks with Evolutionary Strategies: A New Application to Divisia Money.* **Advances in Econometrics**, 19, 127-143

46. Burke E.K., Gustafson S. and Kendall G. (2004) *Diversity in Genetic Programming: An Analysis of Measures and Correlation with Fitness.* **IEEE Transactions on Evolutionary Computation**, 8(1):47-62 (doi:10.1109/TEVC.2003.819263)

    ISI Impact Factor (2009): **4.589**

47. Burke E.K., Kendall G. and Whitwell G. (2004) *A New Placement Heuristic for the Orthogonal Stock Cutting Problem.* **Operations Research**, 52(4), 655-671 (doi:10.1287/opre.1040.0109)

    ISI Impact Factor (2009): **1.576**

48. Gustafson S., Ekart A., Burke E.K. and Kendall G. (2004) *Problem Difficulty and Code Growth in Genetic Programming.* **Genetic Programming and Evolvable Machines**, 5(3), 271-290 (doi:10.1023/B:GENP.0000030194.98244.e3)

    ISI Impact Factor (2009): **1.091**


## 2003

49. Burke E.K., Kendall G. and Soubeiga E. (2003) *A Tabu-Search Hyper-Heuristic for Timetabling and Rostering.* **Journal of Heuristics**, 9(6), 451-470 (doi:10.1023/B:HEUR.0000012446.94732.b6)

    ISI Impact Factor (2009): **1.264**

## 2001

50. Ward C.R., Gobet F., Kendall G. (2001) *Evolving Collective Behavior in an Artificial Ecology*, **Artificial Life** 7(2), 191-209 (doi:10.1162/106454601753139005)

   ISI Impact Factor (2009): **1.960**

## 1999

51. Burke E.K. and Kendall G. (1999) *A Comparison of Meta-Heuristic Algorithms for Clustering Rectangles*, **Computers and Industrial Engineering**, Elsevier, 37(1-2), 383-386 (doi:10.1016/S0360-8352(99)00099-6)

   ISI Impact Factor (2009): **1.491**

# 2.2.  Edited Books

1. Blazewicz J., Drozdowski M., **Kendall G.** and McCollum B. (editors). Proceedings of the MISTA 2009 (The 4th Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 10–12 August 2009, Dublin, Ireland

2. Baptiste P., Munier A., **Kendall G.** and Sourd F. (editors). Proceedings of the MISTA 2007 (The 3rd Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 28–31 August 2007, Paris, France

3. **Kendall G.**, Burke E. K., Tan K. C. and Smith S. Proceedings of the 2007 IEEE Symposium on Computational Intelligence in Scheduling (CISched), 1-5 April 2006, Hawaii, USA.

4. **Kendall G.**, Yao X. and Yew Chong S (editors). The Iterated Prisoner's Dilemma: 20 Years On, World Scientific, 2006

5. Louis S. and **Kendall G**. (editors). Proceedings of IEEE Symposium on Computational Intelligence and Games, 22-24 May 2006, Reno, Nevada, USA.

6. **Kendall G.**, Lei L. and Pinedo M. (editors). Proceedings of the MISTA 2005 (The 2nd Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 18 - 21 July 2005, New York University, USA

7. **Kendall G.** and Lucas S. (editors). Proceedings of IEEE Symposium on Computational Intelligence and Games, 4–6 April 2005, Essex, UK.

8. **Kendall G.**, Burke E.K. and Petrovic S. (editors). Proceedings of the MISTA 2003 (The 1st Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 17- 21 August 2003, The University of Nottingham, UK, Springer

9. Burke E. K. and **Kendall G.** (editors), Search Methodologies: Introductory Tutorials in Optimization and Decision Support Methodologies, Springer 2005.

10. **Kendall G.** et al. Proceedings of the Genetic and Evolutionary Computation Conference 2003 (GECCO 2003), Chicacgo, Illinois, USA, 12-16 July 2003. Lecture Notes in Computer Science (Part 1 (LNCS 2723) & Part 2 (LNCS 2724))

11. **Kendall G.** et. al. Associate Editor of The International Conference on Artificial Intelligence (IC-AI'03), Las Vegas, Nevada, USA, 23-26 June 2003. I organised a special session at this conference entitled Applications of AI in Finance & Economics

12. **Kendall G.** et. al. Associate Editor of The 2002 International Conference on Machine Learning and Applications (ICMLA'02) 24 – 27 June 2002 Monte Carlo Resort, Las Vegas, Nevada, USA where I organised a special session entitled "Machine Learning for "Games" of Perfect and Imperfect Information". (Part of The 2002 International Multiconferences in Computer Science, Monte Carlo Resort, Las Vegas, Nevada, USA, 24 – 27 June 2002)

# 2.3.  Book Chapters

1. Burke E.K. and **Kendall G.** (2011) Hyper-heuristics. Invited chapter in the Encyclopaedia of Operations Research, Wiley

2. Burke, E.K., Hyde M., **Kendall G.**, Ochoa G., Ozcan E. and Woodward J. R. (2010) A Classification of Hyper-heuristic Approaches. In Handbook of Meta-Heuristics (eds. by Gendreau M. and Potvin J-Y.), pages 449-468, Kluwer

3. Burke E.K., Hyde M., **Kendall G.**, Ochoa G., Özcan E. and Woodward J. (2009) Exploring Hyper-heuristic Methodologies with Genetic Programming, Computational Intelligence (eds. Mumford C.L. and Jain L.C.), Springer-Verlag, pp 177-201

4. Yew Chong S., Humble J., **Kendall G.**, Li M. and Yao X. (2007) The Iterated Prisoner's Dilemma: 20 Years On. Chapter 1 of The Iterated Prisoner's Dilemma: 20 Years On (Kendall G., Yao X. and Yew Chong S (eds)), World Scientific

5. Yew Chong S., Humble J., **Kendall G.**, Li M. and Yao X. (2007) Iterated Prisoner's Dilemma and Evolutionary Game Theory. Chapter 2 of The Iterated Prisoner's Dilemma: 20 Years On (Kendall G., Yao X. and Yew Chong S (eds)), World Scientific

6. Yew Chong S., Humble J., **Kendall G.**, Li M. and Yao X. (2007) Learning IPD Strategies Through Coevolution. Chapter 3 of The Iterated Prisoner's Dilemma: 20 Years On (Kendall G., Yao X. and Yew Chong S (eds)), World Scientific

7. Burke E.K. and **Kendall G.** (2005) Introduction, Chapter 1, in Search Methodologies: Introductory Tutorials in Optimization and Decision Support Techniques (eds. Burke E.K. and Kendall G.), Springer, pp 5-18.

8. Sastry K., Goldberg D. and **Kendall G**. (2005) Genetic Algorithms. Chapter 4, in Search Methodologies: Introductory Tutorials in Optimization and Decision Support Techniques (eds. Burke E.K. and Kendall G.), Springer, pp 457-474

9. Bian F., Burke E.K., Jain S., Kendall G., Koole G., Landa Silva J.D., Mulder J., Paelinck M.C.E., Reeves C., Rusdi I. and Suleman M.O. (2005) Making Airline Schedules More Robust, *Multi-disciplinary Scheduling: Theory and Applications* (edited by Kendall G, Burke E.K., Petrovic S. and Gendreau M.), Springer, pp 381-392

10. Burke E.K., Kendall G., Newall J., Hart E., Ross P. and Schulenburg S. (2003) Hyper-heuristics: An Emerging Direction in Modern Search Technology, Handbook of Meta-heuristics (eds. by Glover F. and Kochenberger G.), Chapter 16, pages 457-474, Kluwer

## 2.4. Refereed Conference Publications

1. Swan J., Özcan E. and **Kendall G**. Hyperion - A Recursive Hyperheuristic Framework, accepted for Learning and Intelligent OptimizatioN (LION 5), Jan 17-21, 2011, Rome, Italy

2. Burke E., Hyde M., **Kendall G**. and Ochoa G. The Cross-domain Heuristic Search Challenge - An International Research Competition, accepted for Learning and Intelligent OptimizatioN (LION 5), Jan 17-21, 2011, Rome, Italy

3. Gibbs J. and **Kendall G**. and Ozcan E., Ender (2010) Scheduling English Football Fixtures over the Holiday Period Using Hyper-heuristics. In proceedings of Parallel Problem Solving from Nature (PPSN XI) (eds Schaefer R., Cotta C., Kolodziej J. and Rudolph G.), Krakow, 11-15 Sep 2010. Lecture Notes in Computer Science 6238, pp 496-505 (doi:10.1007/978-3-642-15844-5_50)

4. Burke E.K. and Guo Q. and **Kendall G.** (2010) A Hyper-Heuristic Approach to Strip Packing Problems. In proceedings of Parallel Problem Solving from Nature (PPSN XI) (eds Schaefer R., Cotta C., Kolodziej J. and Rudolph G.), Krakow, 11-15 Sep 2010. Lecture Notes in Computer Science 6238, pp 465-474 (doi:10.1007/978-3-642-15844-5_47)

5. Bell N., Fang X., Hughes R., **Kendall G.**, O'Reilly E. and Qiu S. (2010) Ghost Direction Detection and other Innovations for Ms. Pac-Man. In proceedings of the 2010 IEEE Conference on Computational Intelligence and Games (CIG'10), 18-21 Aug 2010, Copenhagen, Denmark, pp 465-472

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97. **Kendall G**. and Whitwell G. (2001) *An Evolutionary Approach for the Tuning of a Chess Evaluation Function using Population Dynamics*. In proceedings of Congress on Evolutionary Computation 2001 (CEC'01), COEX Center, Seoul, Korea, May 27-29, 2001, pp 995-1002 (an IEEE conference), ISBN : 0-7803-6657-3

98. Cowling P., **Kendall G**. and Soubeiga E. (2000) *A Hyperheuristic Approach to Scheduling a Sales Summit*. In LNCS 2079, Practice and Theory of Automated Timetabling III : Third International Conference, PATAT 2000, Konstanz, Germany, August 2000, selected papers (eds Burke E.K. and Erben W), Springer-Verlag, pp 176-190, ISBN : 3-540-42421-0.

99. Burke E. and **Kendall G**. (1999) *Evaluation of Two Dimensional Bin Packing Problem using the No Fit Polygon*, Proceedings of the 26$^{th}$ International Conference on Computers and Industrial Engineering, Melbourne, Australia, 15-17 December 1999, pp 286-291

100. Burke E. and **Kendall G**. (1999) *Applying Ant Algorithms and the No Fit Polygon to the Nesting Problem*, Proceedings of 12th Australian Joint Conference on Artificial Intelligence, Sydney, Australia, 6-10 December 1999, Lecture Notes in Artifcial Intelligence (1747), Foo, N. (Ed), pp 453-464, ISBN : 3-540-66822-5

101. Burke E. and **Kendall G**. (1999) *Applying Simulated Annealing and the No Fit Polygon to the Nesting Problem*, Proceedings of WMC '99 : World Manufacturing Congress, Durham, UK, 27-30 September, 1999, pp 70-76, ISBN : 3-906454-19-3

102. Burke E. and **Kendall G**. (1999) *Applying Evolutionary Algorithms and the No Fit Polygon to the Nesting Problem*, in proceedings of IC-AI'99 : The 1999 International Conference on Artificial Intelligence, Las Vegas, Nevada, USA, 28 June - 1 July 1999, pp 51-57, ISBN : 1 892512-16-5

## 2.5. Refereed Extended Abstracts

1. Bai R. and **Kendall G.** (2010) *Tabu assisted guided local search approaches for freight service network design*. In proceedings of the 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), 11-13 August 2010, Queen's University, Belfast, UK, pp 468-471

2. Hayati Abdul Hamid N., Mohamed Ramli N., **Kendall G.** and Mohd Hussin N (2010) *A Weighted-Goal-Score Approach to Measure Match Importance in the Malaysian Super League*. In proceedings of the 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), 11-13 August 2010, Queen's University, Belfast, UK, pp 502-506

3. Burke E.K., Curtois T., Hyde M., **Kendall G.**, Ochoa G., Petrovic S. and Vazquez-Rodriguez J.A. (2009) *HyFlex: A Flexible Framework for the Design and Analysis of Hyper-heuristics*. In proceedings of the 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), 11-13 August 2010, Queen's University, Belfast, UK, pp 790-797

4. Bai R. and **Kendall G** (2003) *An Investigation of Automated Planograms Using a Simulated Annealing Based Hyper-heuristics.* In proceedings of The Fifth Metaheuristics International Conference (MIC 2003), 23-25 August 2003, Kyoto International Conference Hall, Kyoto, Japan

5. Burke E., **Kendall G.** (2003) O'Brien R., Redrup D and Soubeiga E. *An Ant-Algorithm Hyper-heuristic.* In proceedings of The Fifth Metaheuristics International Conference (MIC 2003), 23-25 August 2003, Kyoto International Conference Hall, Kyoto, Japan

## 2.6. Books

1. Become a Microsoft Windows NT Product Specialist - Correspondence Course, published by The Computer Training Institute, 1998
2. Become a Microsoft Windows 98 Product Specialist - Correspondence Course, published by The Computer Training Institute, 1998
3. GCSE Information Systems, published by First & Best in Education Ltd., 1998, ISBN: 1860834639
4. Become a Microsoft Windows 95 Product Specialist - Correspondence Course, published by The Computer Training Institute, 1997
5. GCSE Information Technology, published by First & Best in Education Ltd., 1996, ISBN: 1860832873
6. Become a Microsoft Windows 3.1 Product Specialist - Correspondence Course, published by The Computer Training Institute, 1996
7. 'A' Level Computer Studies, First & Best in Education Ltd., 1998 (In progress)

The books written for The Computer Training Institute allow students to study and reach a stage where they can take an examination and become an MCPS (Microsoft Certified Product Specialist). This is an internationally recognised qualification which can form the basis for MCSE (Microsoft Certified Systems Engineer) certification.
As well as developing the courses, I also act as a course tutor. Students send me their assignments and I mark and comment on them. I also answer any questions they might have.

The books written for First & Best are text books used in secondary schools to enable students study for a GCSE in Information Technology.

## 2.7. Other Publications

As a freelance writer I have published over 400 magazine articles. A sample are listed here.

1. Kendall G. 1998. Survival of the Fittest - Genetic Algorithms. Freelance Informer, 23/01/98, p 74
2. Kendall G. 1998. Travels with my Agent - TSP Problem. Freelance Informer, 09/01/98, p 76
3. Kendall G. 1997. Round and Around - Recursion. Freelance Informer, 19/09/97, p 70
4. Kendall G. 1995. Instruct to Construct (C++). EXE, 04/95, p 35
5. Kendall G. 1996. Abstract Data Types - 1. Computing, 21/03/96, p 44
6. Kendall G. 1996. Abstract Data Types - 2. Computing, 28/03/96, p 41
7. Kendall G. 1996. Abstract Data Types - 3. Computing, 04/04/96, p 36
8. Kendall G. 1996. Project Management Made Simple. Computer Contractor, 10/05/96, p 35
9. Kendall G. 1996. The Big Squeeze - Data Compression. PC Pro, issue 22/96, p 190
10. Kendall G. 1996. The End is Nigh - Year 2000 Problem. Freelance Informer, 20/09/96, p 54

11. Kendall G. 1995. Designing Objects. Computing, 17/08/95, p 22
12. Kendall G. 1995. Object Based Versus Object Oriented. Computing, 31/08/95, p 40
13. Kendall G. 1995. Connecting a light bulb to the Internet. Computing, 09/11/95, p 47

# 3. Research Funding

This section has been split into the following sub-sections; grants awarded as principal investigator, grants awarded as a co-investigator, internal funding and other funding.

## 3.1. Principal Investigator

| | | |
|---|---|---|
| **Title** | : | **An Investigation of Regulatory Decision Making by Automated Decision Makers** |
| Funding Body | : | EPSRC (Ref EP/ E017975 /1) |
| Date Advised Funding was Secured | : | Jun 2006 |
| Project Start Date | : | Oct 2006 |
| Length of Project | : | 3 years (ends Oct 2009) |
| Grant Total | : | £222,411 |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Pollard S. (Cranfield), Soane E. (LSE) |

| | | |
|---|---|---|
| **Title** | : | **NETWORK: Interdisciplinary Cutting, Packing and Space Allocation** |
| Funding Body | : | EPSRC (Ref EP/D031079/1) |
| Date Advised Funding was Secured | : | Oct 2005 |
| Project Start Date | : | Mar 2006 |
| Length of Project | : | 3 year (ends Feb 2009) |
| Grant Total | : | £63,212 |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Burke E. K. |

| | | |
|---|---|---|
| **Title** | : | **Symposium on Computational Intelligence & Games** |
| Funding Body | : | EPSRC (Ref EP/C546024/1) |
| Date Advised Funding was Secured | : | Apr 2005 |
| Project Start Date | : | Jul 2005 |
| Length of Project | : | 1 year (ends Jun 2006) |
| Grant Total | : | £3,880 (to Nottingham), £3,880 (to Essex) |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Lucas S. (Essex, EP/C546016/1) |

| | | |
|---|---|---|
| **Title** | : | **An Investigation of Cutting/Packing and Planning using Automated Algorithm Selection** |
| Funding Body | : | EPSRC (Ref GR/S52414/01) |
| Date Advised Funding was Secured | : | Aug 2003 |
| Project Start Date | : | Feb 2004 |
| Length of Project | : | 3 years (ends Feb 2007) |
| Grant Total | : | £153,670 (to Nottingham), £150,105 (to Southampton) |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Burke E. K. (Nottingham) and Bennell J. (Southampton, GR/S52421/01) |

| | | |
|---|---|---|
| **Title** | : | **Prisoners Dilemma Competition: Celebrating the 20th Anniversary** |
| Funding Body | : | EPSRC (Ref GR/S63465/01) |
| Date Advised Funding was Secured | : | June 2003 |
| Project Start Date | : | April 2004 |
| Length of Project | : | 18 months (ends September 2005) |
| Grant Total | : | £11,848 (to Nottingham), £11,870 (to Birmingham) |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Yao X. (University of Birmingham, GR/S63472/01) |

| Title | : | **Scheduling Agents for distributed timetabling and rostering - A Visiting Fellowship** |
|---|---|---|
| Funding Body | : | EPSRC (Ref GR/S53459) |
| Date Advised Funding was Secured | : | February 2003 |
| Project Start Date | : | July 2003 |
| Length of Project | : | 9 months (ends April 2004) |
| Grant Total | : | £10.350 |
| Involvement | : | Principal Investigator |

| Title | : | **An Investigation Novel Methods for Optimising Shelf Space Allocation** |
|---|---|---|
| Funding Body | : | EPSRC (Ref GR/R60577) |
| Date Advised Funding was Secured | : | June 2001 |
| Project Start Date | : | July 2002 |
| Length of Project | : | 3 years (ends July 2005) |
| Grant Total | : | £62,947 |
| Involvement | : | Principal Investigator |

## 3.2.  Co-Investigator

| Title: | Towards More Effective Computational Search |
|---|---|
| Funding Body: | EPSRC (Ref EP/H000968/1) |
| Amount Awarded: | £1,001,333 |
| Principal Investigator: | E.K.Burke |
| Co-Investigators: | G.Kendall, N.Krasnogor, A.Parkes, S.Petrovic, R.Qu, J.D.Landa Silva |
| Start Date: | 22nd February 2010 |
| End Date: | 21st February 2015 |
| Notes: | This is a renewal of a previous platform award. |

| Title | : | **Towards More Effective Computational Search** |
|---|---|---|
| Funding Body | : | EPSRC (Ref EP/H000968/1) |
| Principal Investigator | : | Burke K. K. |
| Other Investigators | : | Kendall G., Krasnogor N., Landa-Silva J.D., Parkes A., Petrovic S. and Qu R. |
| Date Advised Funding was Secured | : | Jun 2009 |
| Project Start Date | : | Sep 2009 |
| Length of Project | : | 5 years (ends Aug 2014) |
| Grant Total | : | £1,011,159 |
| Involvement | : | Co-Investigator |

| Title | : | **Next Generation Decision Support: Automating the Heuristic Design Process** |
|---|---|---|
| Funding Body | : | EPSRC (EP/D061571/1) |
| Principal Investigator | : | Burke K. K. |
| Co-Investigators | : | Kendall G., Qu R., Petrovic S., Garibaldi J., Krasnogor N., Landa-Silva J.D. |
| Date Advised Funding was Secured | : | May 2006 |
| Project Start Date | : | Mar 2006 |
| Length of Project | : | 5 years (ends Feb 2011) |
| Grant Total | : | £2,663,528 |

| Title | : | **An investigation of the role of Genetic Programming in a Hyper-Heuristic Framework** |
|---|---|---|
| Funding Body | : | EPSRC (EP/C523385/1) |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators | : | Kendall G., Krasnogor N, Poli R. (Essex) |

| | | |
|---|---|---|
| Date Advised Funding was Secured | : | May 2005 |
| Project Start Date | : | Oct 2005 |
| Length of Project | : | 3 years (ends Sep 2008) |
| Grant Total | : | £227,675 (Nottingham), £246,984 (Essex: EP/C523377/1) |

| | | |
|---|---|---|
| **Title** | : | **Immersive Computing Games: A Visiting Fellowship** |
| Funding Body | : | EPSRC (EP/C546962/1) |
| Principal Investigator | : | Bai L. |
| Co-Investigators | : | Kendall G., Logan B. S. |
| Date Advised Funding was Secured | : | Jul 2005 |
| Project Start Date | : | Sep 2005 |
| Length of Project | : | 3 years (ends Aug 2008) |
| Grant Total | : | £14,374 |

| | | |
|---|---|---|
| **Title** | : | **Hyper-heuristics for Scheduling, Rostering and Routing: An International Collaboration: A Visiting fellowship (Prof. Michel Gendreau)** |
| Funding Body | : | EPSRC (EP/D027039/1) |
| Principal Investigator | : | Garibaldi J. |
| Co-Investigators | : | Burke E. K., Kendall G. |
| Date Advised Funding was Secured | : | May 2005 |
| Project Start Date | : | May 2006 |
| Length of Project | : | 5 years (ends May 2011) |
| Grant Total | : | £31,828 |

| | | |
|---|---|---|
| **Title** | : | **Adaptive Multi-Objective Heuristic and Meta-heuristic Approaches to Space Allocation** |
| Funding Body | : | EPSRC (GR/T26115/01) |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators | : | Kendall G., Medjdoub B., Landa-Silva J. D. |
| Date Advised Funding was Secured | : | May 2005 |
| Project Start Date | : | Apr 2005 |
| Length of Project | : | 4 years (ends Apr 2009) |
| Grant Total | : | £205,378 |

| | | |
|---|---|---|
| **Title** | : | **DNA Mapping by Combinatorial Optimisation - A Visiting Fellowship  (Prof. Jacek Blazewicz)** |
| Funding Body | : | EPSRC (GR/S64530/01) |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators | : | Hirst J, Kendall G. and Krasnogor N. |
| Amount Awarded | : | £10,224 |
| Date Advised Funding was Secured | : | Jul 2003 |
| Project Start Date | : | Sep 2003 |
| Length of Project | : | 3 years (ends May 2007) |
| Notes | : | This is a visiting fellowship to enable Prof Jacek Blazewicz to visit the research group for 3 visits over a three year period. |

| | | |
|---|---|---|
| **Title** | : | **PLATFORM: Towards More General Optimisation/Search Systems** |
| Funding Body | : | EPSRC (GR/S70197/01) |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators | : | Petrovic S., Kendall G., Garibaldi J. M. and Krasnogor N. |
| Date Advised Funding was Secured | : | Aug 2003 |
| Project Start Date | : | Feb 2004 |
| Length of Project | : | 5 years (ends Jan 2009) |
| Grant Total | : | £422,908 |
| Recognised Researcher | : | Dowsland K. A. |

| Title | : | **Novel Metaheuristic Research Directions in Healthcare Personnel Rostering** |
|---|---|---|
| Funding Body | : | EPSRC (Ref GR/S31150/01) |
| Principal Investigator (Nottingham) | : | Burke E. K. |
| Co-Investigators | : | Petrovic S. and Kendall G. |
| Date Advised Funding was Secured | : | Feb 2003 |
| Project Start Date | : | Oct 2003 |
| Length of Project | : | 3 years (ends Mar 2007) |
| Grant Total | : | £298,081 (£191,581 from EPSRC) (ORTEC Consultants B.V. £81,000), Gower optimal Algorithms Ltd (£22,500) and KaHo St-Lieven (£3,000) |

| Title | : | **Fuzzy Multicriteria Approaches to Scheduling and Rescheduling Problems in Uncertain Environments** |
|---|---|---|
| Funding Body | : | EPSRC (Ref GR/R95319/01) |
| Principal Investigator (Nottingham) | : | Petrovic S. |
| Co-Investigators | : | Burke E.K. and Kendall G. |
| Date Advised Funding was Secured | : | Jul 2002 |
| Project Start Date | : | Jan 2003 |
| Length of Project | : | 3 years (ends Feb 2006) |
| Grant Total | : | £422,337 (£211,594 to Nottingham) (£210,743 to Coventry) |
| Personnel working on Project | : | To be appointed |
| Notes | : | This is a joint project between The University of Nottingham and Coventry University (GR/R95326, Dr D Petrovic) |

| Title | : | **INTERACT CHINA: A New Research Collaboration between The University of China and the Chinese Academy of Science** |
|---|---|---|
| Funding Body | : | EPSRC (GR/S73150/01) |
| Principal Investigator | : | Bai L. |
| Co-Investigators | : | Kendall G. |
| Date Advised Funding was Secured | : | December 2003 |
| Project Start Date | : | 1st April 2004 |
| Length of Project | : | 3 months |
| Grant Total | : | £5,924 |

| Title | : | **A Hybrid Meta-heuristic Approach to Simplified Sequence-Structure-Function Problems** |
|---|---|---|
| Funding Body | : | BBSRC & EPSRC (Bio-informatics initiative) (Ref 42/BIO14458) |
| Principal Investigator | : | Hirst J., Chemistry |
| Co-Investigators | : | Burke E. K., Cowling P. I., Kendall G. and Petrovic S. |
| Date Advised Funding was Secured | : | 1st December 2000 |
| Project Start Date | : | Jan 2001 |
| Length of Project | : | 3 years |
| Grant Total | : | £134,844 |
| Personnel working on Project | : | Krasnogor N. |
| Notes | : | This is a joint project between the School of Computer Science and IT and the School of Chemistry, Nottingham |

| Title | : | **An Investigation of Hyper-Heuristic Methods** |
|---|---|---|
| Funding Body | : | EPSRC (Ref GR/N36837/01) |
| Principal Investigator (Nottingham) | : | Burke E. K. |
| Co-Investigators (Nottingham) | : | Cowling P.I., Kendall G. and Petrovic S. |
| Principal Investigator (Napier University) | : | Ross R. |
| Co-Investigator (Napier University) | : | Hart E. |
| Date Advised Funding was Secured | : | Aug 2000 |

| | | |
|---|---|---|
| Project Start Date | : | Oct 2000 |
| Length of Project | : | 3 years |
| Grant Total | : | £452,890 (£196,343 to Nottingham) (£256,547 to Napier) |
| Personnel working on Project | : | Newall J. (Post Doc Research Assistant) and David Redrup (PhD student) |
| Notes | : | This is a joint project between the University of Nottingham and Napier University |

| | | |
|---|---|---|
| **Title** | **:** | **An Interdisciplinary Scheduling Network** |
| Funding Body | : | EPSRC (Ref GR/N35205) |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators (Nottingham) | : | Cowling P. I., Kendall G. and Petrovic S. |
| Date Advised Funding was Secured | : | Jan 2001 |
| Project Start Date | : | May 2001 |
| Length of Project | : | 3 years |
| Grant Total | : | £62,985 |
| Notes | : | This project had 14 initial partner universities from across the UK. We intend to increase that number as the project progresses |

| | | |
|---|---|---|
| **Title** | **:** | **Scheduling Agents for Distributed Timetabling and Rostering - A Visiting Fellowship (Prof. Amnon Meisels)** |
| Funding Body | : | EPSRC (Ref GR/S53459/01) |
| Date Advised Funding was Secured | : | Jun 2003 |
| Project Start Date | : | Jul 2003 |
| Length of Project | : | 3 months (extended to June 2004) |
| Grant Total | : | £10,350 |
| Involvement | : | Principal Investigator |
| Other Investigators | : | Burke E. K. and Petrovic S. |

| | | |
|---|---|---|
| **Title** | **:** | **Tutorials in Optimisation and Search Methodology: A Workshop at the Interface of Artificial Intelligence and Operational Research** |
| Funding Bodies | : | EPSRC and the London Mathematical Society (LMS) under the Mathematics for IT (MathFIT) initiative. |
| Principal Investigator | : | Burke E. K. |
| Co-Investigators | : | Petrovic S. and Kendall G. |
| Co-Author | : | Landa Silva J. D. |
| Date Advised Funding was Secured | : | Feb 2003 |
| Project Start Date | : | March 2003 |
| Length of Project | : | 8 months |
| Grant Total | : | £5000 |
| Notes | : | This grant is supporting the (INTROS) workshop. |

| | | |
|---|---|---|
| **Title** | **:** | **A Dual Examination of Scheduling Problems - A Visiting Fellowship (Prof. M Dror)** |
| Funding Body | : | EPSRC (Ref GR/S07124/01) |
| Principal Investigator | : | Petrovic S. |
| Co-Investigators | : | Burke E. K. and Kendall G. |
| Date Advised Funding was Secured | : | Jul 2002 |
| Project Start Date | : | Jul 2002 |
| Length of Project | : | 3 months |
| Grant Total | : | £7,800 |

| | | |
|---|---|---|
| **Title** | **:** | **Applying meta-heuristics and hyper-heuristics to stock cutting** |
| Funding Body | : | EPSRC and Esprit Automation Limited |

| | | |
|---|---|---|
| Type of Award | : | CASE (Co-operative Awards in Science and Engineering) for New Academics (CNA 00802329) |
| Date Advised Funding was Secured | : | Sep 2000 |
| Project Start Date | : | Oct 2000 |
| Length of Project | : | 3 years |
| Grant Total | : | £42,120 (£28,920 from EPSRC) (£13,200 from Esprit) |
| Involvement | : | Principal Investigator |
| Personnel working on Project | : | Whitwell G. (PhD Student) |

| | | |
|---|---|---|
| **Title** | **:** | **New Approaches to Produce Efficient Nesting Patterns** |
| Funding Body | : | Teaching Company Directorate (Department of Trade and Industry (DTI)) |
| Type of Award | : | TCS Programme No 3047 between the University of Nottingham and Esprit Automation Limited |
| Date Advised Funding was Secured | : | Mar 2000 |
| Project Start Date | : | Oct 2000 |
| Length of Project | : | 3 years |
| Grant Total | : | £126,268 (£86,268 from DTI) (£40,400 from Esprit) |
| Involvement | : | Academic Supervisor |
| Personnel working on Project | : | Hellier R. |

## 3.3.  Internal Funding

| | | |
|---|---|---|
| **Title** | : | **Develop Introduction to Artificial Intelligence Course (G5AIAI) as a Flexible Learning Course** |
| Funding Body | : | The University of Nottingham (Ref 00TL/208) |
| Date Advised Funding was Secured | : | 9th August 2001 |
| Project Start Date | : | August 2001 |
| Length of Project | : | 5 months |
| Grant Total | : | £1500 |
| Involvement | : | Project Leader |

**Title**  :  **Universitas 21**

In December 2001 I was awarded £1500 by Universitas 21 to develop research and teaching links with The University of Queensland in Australia.

**Title**  :  **International Teaching**

Each time I have been invited to teach in Konstanz (Germany) and Ghent (Belguim), the Socrates scheme has contributed to the costs, which has been to a level of about £400 each year.

**Title**  :  **Research Collaboration with EU Partners**

I have twice (2000 and 2001) visited the EU with the aim of developing research proposals with EU partners. On these occasions the international office has contributed to the cost by supplying £350 (total £700)

| | | |
|---|---|---|
| **Title** | : | **Develop Artificial Intelligence Methods (G5BAIM) and Operating Systems (G53OPS) as Flexible Learning Courses** |
| Funding Body | : | The University of Nottingham (Ref 01TL/229) |
| Date Advised Funding was Secured | : | 16th July 2002 |
| Project Start Date | : | August 2002 |
| Length of Project | : | 10 months |
| Grant Total | : | £3689 |
| Involvement | : | Project Leader |

## 3.4.  Other Funding

| | | |
|---|---|---|
| **Title** | : | **Develop Collaborative Research Links with Edith Cowan University, Perth, Western Australia** |
| Funding Body | : | Edith Cowan University, Perth, Western Australia |
| Date Advised Funding was Secured | : | Aug 2003 |
| Project Start Date | : | Dec 2003 |
| Length of Project | : | 2 weeks |
| Grant Total | : | $2,495 (AUD) |
| Notes | : | Edith Cowan University awarded me a grant of $2,495 (for internal flight, accommodation and subsistence) to visit their university to start developing a collaborative research relationship. |

| | | |
|---|---|---|
| **Title** | : | **Commercialisation of Internationally Leading Cutting and Packing Technologies** |
| Funding Body | : | Nottingham Innovation and Regional Award (NIRA). NIRA is funded by HEFCE under the HEROBaC Transitional Fund (HIRF/084) |
| Date Advised Funding was Secured | : | Apr 2004 |
| Project Start Date | : | Apr 2004 |

| | | |
|---|---|---|
| Grant Total | : | £6,000 |
| Lead Award Holder | : | Burke  E. K. |
| Other Award Holders | : | Kendall G. and Ford P.H. |
| Length of Project | : | 18 months. |
| Notes | : | This project supports the spin off of Aptia Solutions Ltd to commercially exploit new cutting/packing technologies in a range of industries. |

| | | |
|---|---|---|
| **Title** | **:** | **Decision Support for the Textile and Leather Industries - A HEROBC Innovation and Regional Fellowship (HIRF)** |
| Funding Body | : | HIRF is funded by HEFCE under the HEROBC II Programme and the East Midlands Development Agency (EMDA) (HIRF/084) |
| Date Advised Funding was Secured | : | April 2004 |
| Project Start Date | : | April 2004 |
| Grant Total | : | £12,330 |
| Lead Award Holder | : | Burke E. K. |
| Other Award Holders | : | Kendall G. and Ford P.H. |
| Length of Project | : | 18 months. |
| Notes | : | This project is concerned with taking to market the cutting/packing research of the ASAP group in the leather/textile industries. It will be conducted in conjunction with the NIRA award (see above) and is supported by it. |

# 4. Editorial Roles

## 4.1. Journal Editorships

1. Associate Editor of **Journal of the Operational Research Society** (2010 – present)
2. Associate Editor of **IEEE Transactions on Evolutionary Computation** (2009 – present)
3. Associate Editor of **IEEE Transactions on Computational Intelligence and AI in Games** (2009 – present)
4. Associate Editor of **Computational Intelligence** (2007 – present)
5. Associate Editor of the **International Journal of Systems Science** (2003 – present)
6. Associate Editor of **Intelligent Systems in Accounting Finance and Management** (2003 – 2009)
7. Associate editor of **INFOR: Information Systems and Operational Research** (2004 – present)
8. Associate Editor of **Cognitive Neurodynamics** (2005 – present)
9. Associate Editor of **International Journal of Intelligent Computing and Cybernetics** (2007 – present)

## 4.2. Edited Books

See section 2.2

## 4.3. Guest Editing Journals

1. Blazewicz J., Drozdowski M., **Kendall G**. and McCollum B. (editors). Guest editor of a forthcoming special issue of the **Journal of Scheduling** containing selected papers from the MISTA 2009 (The 4th Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 10–12 August 2009, Dublin, Ireland

2. Baptiste P., Munier A., **Kendall G**. and Sourd F. (editors). Guest editor of **Journal of Scheduling** containing selected papers from the MISTA 2007 (The 3rd Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 28–31 August 2007, Paris, France
*Journal of Scheduling*, Special Issue on MISTA Conference 2007 (Baptiste P., Kendall G., Munier A., and Sourd F. (eds)), Vol. 12(6), 2009 (see http://www.springerlink.com/content/1094-6136/12/6/). This issue contains 5 articles.

3. **Kendall G**. and Schaeffer J. (editors). Guest co-editor of a forthcoming issue of the **International Computer Games Association** (ICGA) Journal on "Poker"

4. Burke E. K., **Kendall G**., Tan K-C. and Smith S. (editors). Guest Co-editor of a forthcoming issue of **Annals of Operations Research** containing selected papers from the 2007 IEEE Symposium on Computational Intelligence in Scheduling, 1-5 April 2006, Hawaii, USA.

5. Burke E. K., Daniels K. and **Kendall G**. (editors). Guest Co-editor of **Annals of Operations Research** on Cutting, Packing and Layout containing selected papers from the Dagstuhl seminar (07112), 13-16 March 2007, Cutting, Packing and Space Allocation (see http://www.dagstuhl.de/07112).
*Annals of Operations Research*, Special issue on Cutting, Packing and Space Allocation (Kendall G., Daniels K. and Burke E.K. (eds)), Vol. 179(1), 2010 (see http://www.springerlink.com/content/0254-5330/179/1/). This issue contains 20 articles.

6. **Kendall G**., Lei L. and Pinedo M. (editors). Guest Co-editor of **Annals of Operations Research** (selected papers from the MISTA 2005 (The 2nd Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 18-21 July 2005, New York University, USA)
*Annals of Operations Research*, Special Issue on Multidisciplinary Scheduling: Theory and Applications (MISTA) (Kendall G., Lei L. and Pinedo M. (eds)), Vol. 159(1), 2008 (see http://www.springerlink.com/content/0254-5330/159/1/). This issue contains 27 articles.

7. Binner J., **Kendall G**. and Chen S-H (editors) Guest Co-editor of **Advances in Econometrics**, vol. 19, 2004 (Applications of AI in Finance & Economics)

# 5. Supervision

## 5.1. Current PhD Supervision

1. **Nasser R. Sabar**: Timetabling, Started July 2010 (External co-supervisor for a student at Universiti Kebangsaan Malaysia)

2. **Jacomine Grobler**: A Population-based Hyper-heuristic for Improved Decision Support, Started June 2009 (External co-supervisor for a student at the University of Pretoria, South Africa). This is a paid position.

3. **Abdullah Muhammed**: Real World Examination Timetabling, started July 2008

4. **Mohd N Mohmad Kahar (Nizam)**: Case Study of Examination Timetabling, started September 2007

5. **Zalilah Abd Aziz**: Ant Algorithm Hyper-heuristics, Started February 2007

6. **Nor Hayati Abdul Hamid (Yati)**: Maximisation of Crowds at Sports Venues. Started May 2007

7. **Robert Hellier**: Automated Algorithm Selection for Cutting and Packing, Started December 2002 (part time)

## 5.2. MRes Supervision

1. **Pai Chun Chen**: Ant Algorithm Hyper-heuristic for Sports Scheduling. *Started Sep 2005, Graduated 2007, Viva Date 20th Nov 2006*

## 5.3. Completed PhD Students

1. **Sam Allen**: Three Dimensional Cutting and Packing, *started October 2007*

2. **Qiang Quo**: Evolutionary algorithms for orthogonal packing problems. *Started October 2006, Graduated ??????, Viva Date 21st April 2011*

3. **Belal Ismail Khalil Al-Khateeb**: Investigating evolutionary checkers by incorporating individual and social learning, N-tuple and a round robin tournament. *Started October 2007, Graduated July 2011, Viva Date 19th April 2011*

4. **Douglas Moody**: A Tiling Approach to Producing High Quality Solutions To Real World Timetabling Problems, Started June 2006 (External co-supervisor for a student at the New York City College of Technology, USA). *Started June 2006, Graduated May 2011, Viva Date 15th December 2010*

5. **Robert Oates**: The Suitability of the Dendritic Cell Algorithm for Robotic Security Applications. *Started January 2006, Graduated July 2010, Viva Date 5th March 2010*

6. **Matthew Hyde**: A Genetic Programming Hyper-Heuristic Approach to Automated Packing. *Started September 2005, Graduated July 2010, Viva Date 8th December 2009*

7. **Christian Barteczko-Hibbert**: An Artificial Neural Network Model for the Optimisation of Diverse Domestic Energy Systems. *Started January 2005, Graduated July 2009, Viva Date 24th November 2008*

8. **Ben Moss**: The Data Integrity Problem and Multi-Layered Document Integrity. *Started September 2000, Graduated July 2008, Viva Date 28th November 2007*

9. **Nasreddine Hallam:** State-of-The-Art Multi Objective Evolutionary Algorithms: Diversity Preservation and Archive Update Analysis, and Proposal of A New Evolutionary Algorithm. *Started January 2004, Graduated January 2007, Viva Date 14th June 2006*

10. **Razali Yaakob**: Integration of a Best Population Pool and Social Learning: An Investigation in Game Playing. *Started July 2002, Graduated July 2008, Viva Date 7th March 2008*

11. **Kristian Spoerer**: The Lemmings Puzzle: Computational Complexity of an Approach and Identification of Difficult Instances. *Started September 2002, Graduated Jul        y 2007, Viva Date 23rd February 2007*

12. **Samih Tadrus**: Generic Multi-Pheromone Quality of Service Routing. *Started September 2000, Graduated July 2007, Viva Date 27th April 2007*

13. **Yan Su**: An Investigation of Continuous Learning in Incomplete Environments. *Started October 2001, Graduated July 2005, Viva Date 21st December 2004*

14. **Limin Han**: An Investigation of a Genetic Algorithm Based Hyper-heuristic Applied to Scheduling Problems. *Started October 2000, Graduated July 2005, Viva Date 14th September 2004*

15. **Naimah Mohd Hussin**: Tabu Search Based Hyper-heuristic Approaches for Examination Timetabling. *Started January 2001, Graduated July 2005, Viva Date 29th April 2005*

16. **Ruibin Bai**: An Investigation of Novel Approaches for Optimising Retail Shelf Space Allocation. *Started August 2002, Graduated July 2005, Viva Date 2nd November 2004*

17. **Masri Ayob**: Optimisation of Surface Mount Device Placement Machine in Printed Circuit Board Assembly. *Started September 2001, Graduated July 2005, Viva Date 17th March 2005*

18. **Glenn Whitwell**: Novel Heuristic and Metaheuristic Approaches to Cutting and Packing. *Started October 2000, Graduated July 2005, Viva Date 12th March 2004*

19. **Steven Gustafson**: An Analysis of Diversity in Genetic Programming. *Started January 2001, Graduated July 2004, Viva Date 15th February 2004*

20. **Eric Soubeiga**: Development and Application of Hyper-heuristics to Personnel Scheduling. *Started October 1999. Graduated July 2003, Viva Date 10th March 2003*

# 6. Lecturing, Supervision and Invited Talks

My teaching experience is presented in the following categories: University of Nottingham teaching (including supervision), International teaching, Invited Talks and other teaching experience.
Please note that some of this teaching took place before I took up my lectureship positions. This is due to the fact that I was teaching in the School of Computer Science & IT at The University of Nottingham whilst still a PhD student.

## 6.1. University of Nottingham

### Artificial Intelligence Methods (G5BAIM)

For eleven years, in semester two of 1997-1998, 1998-1999, 1999-2000, 2000-2001, 2001-2002, 2002-2003, 2003-2004, 2004-2005, 2005-2006, 2006-2007, 2008-2009, I have run an Artificial Intelligence Methods (G5BAIM) course. This comprises up to 24 one hour lectures, between one and three pieces of coursework and a two hour examination.

### Operating Systems (G53OPS)

For five years, in semester two of 1998-1999, 1999-2000, 2002-2001, 2001-2002 and semester one of 2008-2009, I ran an Operating Systems course (G53OPS). This course comprises 24 one hour lectures, one or two pieces of coursework and a two hour examination.

### Introduction to Artificial Intelligence (G5AIAI)

For six years, in semester one of 2000-2001, 2001-2002, 2002-2003, 2003-2004, 2004-2005, 2005-2006, 2006-2007, I taught an Introduction to Artificial Intelligence (G5AIAI) course. This comprises up to 24 one hour lectures, between one and three pieces of coursework and a two hour examination.
The feedback I have received from this course has been very positive. Some of the comments from the course evaluation forms are shown in appendix A.
In 2001-2002 I received two awards (to the value of £1500 and £3689) from the Teaching Enhancement Office (TEO) at The University of Nottingham. This allowed me to develop my courses as student centered learning (SCL) modules with only six contact hours between the lecturer and the students. This was done to promote SCL and also to provide the opportunity for the course to be run at our campus in Malaysia.

The student feedback I have received from the above courses has been very positive. Some of the comments from the course evaluation forms are shown in appendix A.

### Project Supervision

I have supervised 2$^{nd}$ year group projects for academic years 1997-1998 (1 project), 1999-2000 (2 projects), 2000-2001 (2 projects), 2001-2002 (2 projects), 2002-2003 (2 projects), 2003-2004 (1 project), 2008-2009 (1 project).
In 2001-2002 one of the groups I supervised won the Ford prize (£100) for the group that worked best as a team.
In 2001-2002 I gave the same project to both my groups and offered a £75 prize to the group that won a head-to-head competition on the open day. This form of project was well received by the students and the same idea was used in 2002-2003 and 2003-2004.

I have supervised 3$^{rd}$ year individual dissertations for academic years 1998-1999 (5 projects), 1999-2000 (7 projects), 2000-2001 (11 projects), 2001-2002 (15 projects), 2002-2003 (14 projects), 2003-2004 (11 projects), 2004-2005 (7 projects), 2005-2006 (9 projects), 2008-2009 (6 projects).

For three consecutive years (2000, 2001, 2002) I supervised the project that has won the school prize for the most outstanding project of the year. In 2003, one of my students was runner up. The successful projects were.
- Intelligent Trading of the FTSE-100 Market (prize for academic year 2001/2002), : Student : Shahid Ladha
- Evolving Ant Colony: Optimisation by Distinct, Evolving Ant Agents (prize for academic year 2000/2001), Student : William Ratcliffe
- Evolving Collective Behaviour (prize for academic year 1999/2000), Student : Chris Ward

## 6.2. International Lecturing

### Aarhus, Denmark

I was invited to give 12 hours of lectures, over two days (11$^{th}$ – 12$^{th}$ Feb 2012), on a six day course entitled "*Meta-heuristics with specific applications for logistics*". The other invited speakers were Stefan Voss University of Hamburg) and Karl Doerner (University of Vienna).

The course organiser was Sanne Wøhlk (Aarhus University, Business and Social Sciences, Department of Economics and Business, CORAL – Cluster for Operations Research And Logistics). The course was attended by about 30 people from across Eurpoe, including some people from industry.

The course organisers covered my costs, including the flight from Malaysia.

### Germany (Fachhochschule Konstanz)

I have run modules for a Knowledge Engineering and an Artificial Life/Intelligence course at Fachhochschule Konstanz - University of Applied Sciences, Germany in 1998, 1999, 2000, 2001, 2002 and 2004). These are funded under the SOCRATES programme. The courses comprise twelve hour lectures with one piece of coursework and a written examination.

The course details are:
- Artificial Intelligence (2004)
- Artificial Life (2002)
- Artificial Life (2001)
- Artificial Life (2000)
- Knowledge Engineering (1999)
- Knowledge Engineering (1998)

I receive good reports of my teaching in Germany and the fact I was invited back each year demonstrates the excellence of my teaching.

### Belgium (Kaho, Gent)

In 2002, 2003, 2004, 2005, 2006, 2007, and 2008, I was invited to run Artificial Intelligence courses in Belgium. This was funded partly through the Socrates programme and typically consisted of a fifteen hour lecture course.

### Egypt (MISR International University - MIU)

In October 2003 and July 2004 I was invited to run a short Artificial Intelligence course in Egypt. This was funded by the host university and consisted of 3 hours of lectures on artificial intelligent search methodologies (2003) and 15 hours on evolutionary neural networks (2004).

In November 2005, February 2007 and November 2008, I was invited to present a *Research Skills* course. This is a 5 hour course focussing on how to carry out a review of the literature for undergraduate projects.

I was also invited to attend undergraduate student presentations for academic sessions 2003/2004, 2004/2006, 2005/2006, 2006/2007, 2007/2008. I marked both the presentation and the dissertations.

## 6.3. Invited Talks

I have been invited (both nationally and internationally) to give invited talks, the details of which are shown below.

### Plenary and Keynote Presentations

- Invited Talk: 28th February 2012. I was invited to give a talk at the British High Commission Innovation Workshop: UK Malaysia Innovation Forum: Commercialisation of Science Ideas. My talk was entitled *Commercialisation of Research: Nottingham MyRIAD Solutions Sdn Bhd*.

- Invited Talk: 11th November 2011. I was invited to give a talk to the annual CIRG (Computational Intelligence Research Group) University of Pretoria, South Africa workshop. The talk I gave was entitled *Hyper-heuristics: Past, Present and Future*. All my expenses were paid for this talk.

- Invited Lecture: 10th November 2011. I was invited by IEEE Computational Intelligence Society (CIS) Chapter, South Africa in association with the Computation Intelligence Research Group (CIRG), University of Pretoria to give an invited lecture (for which all expenses were paid). The lecture was entitled *Scheduling English Football Fixtures: Computing Approximate and Exact Solutions*.

- **Invited seminar**: 6th October 2011. I was invited by the Centre for Computational Intelligence, School of Computer Engineering, NTU & IEEE Singapore Computational Intelligence Chapter to give an invited seminar (for which I received a small honorarium). The seminar was entitled *Evolving game playing agents and their inspiration for real world applications*.

- **Plenary talk**: 11th August 2010 at the 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), 11-13 August 2010, Queen's University, Belfast, UK. Title: *Scheduling Football (Soccer) Fixtures: Progress Made to Date and Future Challenges*. Part of this talk is presented in the conference proceedings (Kendall G., McCollum B., Cruz F. and McMullan P. (2010) Scheduling English Football Fixtures: Consideration of Two Conflicting Objectives. In proceedings of the 8th International Conference on the Practice and Theory of Automated Timetabling (PATAT 2010), 11-13 August 2010, Queen's University, Belfast, UK, pp 1-15)

- **Invited keynote** at World Congress on Evolutionary Computation (WCCI), $18^{th}$ July 2010. Title: *Hyperheuristics: Past, Present and Future*. This talk was part of the Systems to Build Systems workshop.

- **Invited keynote** speaker for the National Taught Course Centre in Operational Research, $16^{th}$ April 2010. Title: *Scheduling English Football Fixtures: Progress and Challenges*

- **Invited keynote** speaker at the LANCS Workshop on Systems to Build Systems, 23rd November 2009. Title: *Hyperheuristics: Past, Present and Future*.

- **Invited keynote** speaker for the National Taught Course Centre in Operational Research, 4th April 2008. Title: *Sports Scheduling: A Case Study*

- **Plenary talk** $10^{th}$ August 2006 at the International Conference on Business and IT 2006 (BIZIT'06), Universiti Teknologi MARA, Malaysia, 8-10 August 2006: Title: *Collaborating with Industry: A UK Perspective*.

- **Invited talk** $14^{th}$ July 2004 at **The Royal Institution**. Title: *Games Computers (cannot) Play*. This lecture was to the (fee paying) general public and was very well received. On the feedback forms almost everybody who attended (about 70 people) ticked excellent or good and some of the comments included, "*First Class Talk*", "*Very lively session. Good speaker, good audience. Thank you*", "*Q&A session most productive*" and "*Enthusiastic delivery*"

- **Plenary tutorial** 2nd December 2003 (3 hours) at Artificial Intelligence 2003, **Perth**, Australia. Title: *Artificial Intelligence Techniques for Game Playing*

- **Plenary talk** 12th May 2003at EPSRC Workshop (Interdisciplinary Scheduling Workshop), **Bradford**, UK. Title: *Hyper-heuristics : An Emerging Search Technology*

- **Plenary talk** 19th September 2002 at EPSRC Workshop (Interdisciplinary Scheduling Workshop), Lancaster, UK. Title: *Emerging Research Directions in Scheduling*

## International Invited Talks

- **Invited talk** $25^{th}$ July 2011 at **University of Nottingham, Malaysia Campus Alumni Event** (hosted by the Vice Chancellor (Professor David Greenaway) and the Pro-Vice Chancellor for Internationalisation (Professor Christine Ennew). Title: *Scheduling Football Fixtures: Progress Made to Date and Future Challenges*.

- $10^{th}$ December 2010: Invited Talk at **Universiti Putra Malaysia**: Scheduling English Football Fixtures over Holiday Periods

- $9^{th}$ December 2010: Invited talk at **Universiti Kebangsaan Malaysia, Malaysia**: Research Trends and Directions

- January 26th 2010: Invited talk at **Universiti Kebangsaan Malaysia, Malaysia**: How to be an Effective Researcher

- April 30th 2009: Invited to talk to the **East Midlands Operations Research Group**: Balancing Conflicting Objectives for UK Football

- April 21st 2009: Invited talk at the **University of Nottingham, Ningbo Campus, China**: Balancing Conflicting Objectives for UK Football

- March 17th 2009: **De Montfort University**, Leicester, UK: Balancing Conflicting Objectives for UK Football

- January 20th 2009: An invited talk as part of the Postgraduate Certificate in Higher Education program at the **University of Nottingham, Malaysia Campus**: Balancing Conflicting Objectives for UK Football

- January 15th 2009: **Universiti Kebangsaan Malaysia, Malaysia**: Title: *Hyper-heuristics: Potential Research Directions*

- April $8^{th}$ 2008. **Poznan University of Technology, Poland**. Title: *Sports Scheduling: A Case Study*

- September 21st 2006: **TU/e Eindhoven University of Technology, Holland**: Scheduling English Football Fixtures over Holiday Periods

- August 1st 2006: **Universiti Teknologi MARA, Malaysia**. Title: *Scheduling English Football Fixtures over Holiday Periods*
- August 1st 2006: **Universiti Teknologi MARA**, Malaysia. Title: *An Introduction to Evolutionary Computation*
  July 24th 2006: **Universiti Kebangsaan Malaysia**. Title: *Scheduling English Football Fixtures over Holiday Periods*
- 1st June 2006: New Trends in Scheduling Parallel and Distributed Systems, **Luminy-Marseill**e, France, 28th May – 3rd June 2006: Title: *Scheduling English Football Fixtures over Holiday Periods*
- 1st June 2005. Symposium on Modern Optimisation Methods, 1-3 June 2005, **Ghent**, Belgium. I gave two presentations (*An Introduction to Evolutionary Computation* and *An Introduction to Metaheuristics*)
- 15th April 2005. **New York University**, USA. Title: *Hyper-heuristcs : An Emerging Search Technology*
- 2nd February 2005. **Edith Cowan University**, Perth Australia. Title: *Assessing the Research Quality - The UK Experience*
- 3rd June 2004. **Dagstuhl Seminar** (Scheduling in Computer and Manufacturing Systems, 31st May to 4th June 2004), Germany. Title: *Hyper-heuristcs : An Emerging Search Technology*
- 5th April 2004. Invited Presentation at **Chinese Academy of Science**, Beijing. Title: *Collaborative Research Opportunities between China and the UK* (this visit was supported by EPSRC (GR/S73150/01))
- 30th March 2004. Invited Seminar at **KaHo St.-Lieven**, Gent, Belgium. Title: *Evolutionary Game Playing*
- 19th December 2003. Invited Seminar at **Edith Cowan University**, Perth, Australia. Title: *Hyper-heuristics : An Emerging Search Technology*

I have also given many invited seminars at UK institutions, as well as many internal seminars to my own School/Research Group.

### *Other*

- 11th March 2008. *Proposal Writing Skills for Scientists and Engineers*. This was an invited talk for The University of Nottingham Graduate School course.

## 6.4. Other Teaching Experience

Between 1994 and 1999 I was a part-time tutor for two Further Education establishments. I taught a variety of courses which range from half a day to several weeks.
I have run over 100 courses a sample of which are shown below

- RSA CLAIT II (leads to a recognised qualification)
- IBT II (leads to a recognised qualification)
- RSA Diploma in Information Technology (leads to a recognised qualification)
- Getting the Most from Microsoft Office
- Introduction to the Internet
- Getting the Most from Your Word Processor
- Using Windows 95/98
- Making More use of your Database
- Introduction to Excel

# 7.  Esteem Indicators

In addition to the esteem mentioned elsewhere in this CV (for example, being an associate editor on eight international journals), below are other indicators of my esteem.

## 7.1. EPSRC Peer Review College

Member of the EPSRC Peer Review College (2003-2005, 2006-2009).

## 7.2. EPSRC Panels

20th November: Member of the ICT Prioritisation Panel to rank First Grant, Discipline Hopping, Priority Areas and Standard Research Proposals.
21st October 2008: Member of the ICT Prioritisation Panel to rank First Grant, Discipline Hopping, Priority Areas and Standard Research Proposals.

## 7.3. Fellow of the Operational Research Society

In January 2007 I become a Fellow of the Operational Research Society (FORS). The requirement to become a fellow (which is the highest level of accreditation awarded by the society) is given on their web site as follows:

> "*Fellow of The OR Society (**FORS**), are for those with a significant record of achievement extending over ten years or more in OR.*"

## 7.4. Editorial Panels

1. Member of the Editorial Panel of a feature issue of the European Journal of Operational Research (EJOR ) on "Timetabling and Rostering", issue 153/1, February 2004.

## 7.5. Chairman Duties

1. Fowler J., **Kendall G.** and McCollum B. (editors). Co-chairs of the 5th Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2011**), 9-12 August 2011, Phoenix Arizona

2. Ayob M. and **Kendall G.** 3rd Conference on Data Mining and Optimization (DMO'11), 28 - 29 Jun 2011, Bangi, Malaysia

3. **Kendall G.** and Schoenauer M., Plenary Session Chairs for the 2011 IEEE Congress on Evolutionary Computation (CEC 2011), New Orleans, 5-8 June 2011

4. Blazewicz J., Drozdowski M., **Kendall G.** and McCollum B. (editors). Co-chairs of the 4th Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2009**), 10–12 August 2009, Dublin, Ireland

5. Baptiste P., Munier A, **Kendall G.** and Sourd F. Co-chairs of the 3rd Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2007**) , 28-31 August 2007, Paris, France

6. Kendall G., Daniels K. and Burke E. K. Co-chairs of the Dagstuhl seminar (13-16 March 2007) on Cutting, Packing and Space Allocation, Germany

7. **Kendall G.**, Burke E. K., Tan K. C. and Smith S. Co-chairs of 2007 IEEE Symposium on Computational Intelligence in Scheduling (CISched), 1-5 April 2006, Hawaii, USA

8. Louis S. and **Kendall G.** Co-chairs of the IEEE Symposium on Computational Intelligence and Games (**CIG'06**), 22-24 May, Reno, Nevada, USA

9. **Kendall G.**, Lei L. and Pinedo M. Co-chairs of the 2nd Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2005**) , 18-21 July 2005, New York, USA

10. **Kendall G.** and Lucas S. Co-chairs of the IEEE Symposium on Computational Intelligence and Games (**CIG'05**), 4-6 April 2005, Essex University, Colchester, Essex

11. **Kendall G.**, Burke E. K. and Petrovic S. Co-chairs of the 1st Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2003**) , 13-16 August 2003, Nottingham, UK

12. **Kendall G.** Chairman of the organising committee of The 1st Multidisciplinary International Conference on Scheduling : Theory and Applications (**MISTA 2003**) , 13-16 August 2003, Nottingham, UK

13. Burke E. K. and **Kendall G.** Co-organiser and Co-chair of the INtroductory TutoRials in Optimization, Search and decision support methodologies (**INTROS'03**) , 12 August 2003, Nottingham, UK

14. **Kendall G.** et al. Co-chair of the Special Program Committee on Co-evolution of the Genetic and Evolutionary Computation Conference (**GECCO 2003**) , 12-16 July 2002, Chicago, USA

## 7.6. Steering/Advisory Committees

1. Member of the International Advisory Committee for the International Conference on Pattern Analysis and Intelligent Robotics (ICPAIR 2011), 28th – 19th June 2011, Putrajaya, Malaysia

2. Member of the International Advisory Board of the 25th European Conference on Modelling and Simulation, 7-10 June 2011, Krakow, Poland

3. Member of the Steering Committee of the International Conference on Machine Learning and Applications (ICMLA), 2003 - 2010

## 7.7. Co-chair of Workshops

1. At the Genetic and Evolutionary Computation Conference (**GECCO 2002**), New York, USA, July 9-13, 2002. I co-organised two workshops at this conference entitled "*Scheduling : Bringing Together Theory and Practice*" and "*Scheduling and Logistics*".

2. At the Genetic and Evolutionary Computation Conference (**GECCO 2001**), San Francisco, California, USA, July 7-11, 2001. I co-organised a workshop at this conference entitled "*The Next Ten Years of Scheduling Research*"

## 7.8. Program Committees

1. The 2nd International Workshop on Computer Game and its Applications, (**ComGame 2012**), 6-8 Sep 2012, Gwangju, Korea
   This conference was held in conjunction with The 7th International Conference on Embedded and Multimedia Computing (**EMC-12**)

2. 12th Annual Workshop on Computational Intelligence, (**UKCI 2012**), 5 - 7 Sep 2012, Edinburgh, UK

3. 12th International Conference on Parallel Problem Solving From Nature, (**PPSN 2012**), 1 - 5 Sep 2012, Taormina, Italy

4. Genetic and Evolutionary Computation Conference, (**GECCO 2012**), 7 - 11 Jul 2012, Philadelphia, USA
   As well being on the general Program Committee I was also invited be part of Real World Applications Track

5. 2012 IEEE Congress on Evolutionary Computation, (**CEC 2012**), 10 - 15 June 2012, Brisbane, Australia

6. 12th European Conference on Evolutionary Computation in Combinatorial Optimization, (**EvoCOP 2012**), 11 - 13 Apr 2012, Malaga, SpainNature Inspired Cooperative Strategies for Optimization, (**NICSO 2011**), 20-22 Oct 2011, Cluj Napoca, Romania

7. Advances in Computer Games 13 Conference, (**ACG13**), 20-22 Nov 2011, Tilburg, The Netherlands

8. Nature Inspired Cooperative Strategies for Optimization, (**NICSO 2011**), 20-22 Oct 2011, Cluj Napoca, Romania

9. The 11th UK Workshop on Computational Intelligence (**UKCI 2011**), Sep 2011, Manchester, UK

1. 5th Multidisciplinary International Conference on Scheduling : Theory and Applications, (**MISTA 2011**), 9 - 12 Aug 2011, Arizona, USA

   I am the program chair for this conference series.

2. 9th Metaheuristics International Conference, (**MIC 2011**), 25 - 28 Jul 2011, Udine, Italy

3. Genetic and Evolutionary Computation Conference, (**GECCO 2011**), 12 - 16 Jul 2011, Dublin, Ireland

4. International Symposium on Scheduling 2011, (**ISS 2011**), 2 - 4 Jul 2011, Osaka, Japan

5. International Conference on Pattern Analysis and Intelligent Robotics, (**ICPAIR 2011**), 28 - 29 Jun 2011, Putrajaya, Malaysia

6. 3rd Conference on Data Mining and Optimization (**DMO'11**), 28 - 29 Jun 2011, Bangi, Malaysia

   I am one of the co-chairs for this conference and also sit on the International Advisory Board

7. 2011 IEEE Congress on Evolutionary Computation, (**CEC 2011**), 5 - 8 Jun 2011, New Orleans, USA

   I was one of the plenary chairs of this conference

8.  14th European Conference on Genetic Programming, (**EuroGP 2011**), 27 - 29 Apr 2011, Turin, Italy

9.  11th European Conference on Evolutionary Computation in Combinatorial Optimization, (**EvoCOP 2011**), 27 - 29 Apr 2011, Turin, Italy

10. 2011 IEEE Symposium on Computational Intelligence in Scheduling, (**CISched 2011**), 11 - 15 Apr 2011, Paris, France

11. 2011 IEEE Symposium on Computational Intelligence in Industry, (**CII 2011**), 11 - 15 Apr 2011, Paris, France

12. MultiConferenceEngineers and Computer Scientists 2011, (**IMECS 2011**), 16 - 18 Mar 2011, Hong Kong

13. International Conference on Computers and Games 2011, (**CG 2010**), 24 - 26 Sep 2010, Kanazawa, Japan

14. 10th International Conference on Parallel Problem Solving From Nature, (**PPSN 2010**), 11 - 15 Sep 2010, Krakow, Poland

15. Workshop on Self-tuning, self-configuring and self-generating search heuristics, (**Self\* 2010**), 11 - 15 Sep 2010, Krakow, Poland. Held in conjunction with the 11th International Conference on Parallel Problem Solving From Nature (PPSN 2010)

16. 2010 UK Workshop on Computational Intelligence, (**UKCI 2010**), 8 - 10 Sep 2010, Essex, UK

17. IEEE Symposium on Computational Intelligence and Games, (**CIG 2010**), 18 - 21 Aug 2010, Copenhagen, Denmark

18. 8th International Conference on the Practice and Theory of Automated Timetabling, (**PATAT 2010**), 10 - 13 Aug 2010, Belfast, Ireland

    I was one of the plenary speakers at this conference (**Talk Title:** *Scheduling Football (Soccer) Fixtures: Progress Made to Date and Future Challenges*)

19. 2010 IEEE Congress on Evolutionary Computation, (**CEC 2010**), 18 - 23 Jul 2010, Barcelona, Spain. This congress was part of the 2010 IEEE World Congress on Computational Intelligence (WCCI 2010)

20. 2010 IEEE World Congress on Computational Intelligence, (**WCCI 2010**), 18 - 23 Jul 2010, Barcelona, Spain. I was on the program committee of the Special session on Hybrid Evolutionary Algorithms, Hyper-Heuristics and Memetic Computation

21. Genetic and Evolutionary Computation Conference, (**GECCO 2010**), 7 - 11 Jul 2010, Portland, USA

22. 23rd International FLAIRS Conference, (**FLAIRS 2010**), 15 - 17 May 2010, Coconut Grove, Florida, USA. I was on the program committee of the Special track on AI Planning and Scheduling

23. IV International Workshop on Nature Inspired Cooperative Strategies for Optimization, (**NICSO 2010**), 12 - 14 May 2010, Granada, Spain

24. 10th European Conference on Evolutionary Computation in Combinatorial Optimization, (**EvoCOP 2010**), 7 - 9 Apr 2010, Istanbul, Turkey

25. 13th European Conference on Genetic Programming, (**EuroGP 2010**), 7 - 9 Apr 2010, Istanbul Technical University, Istanbul, Turkey

26. 7th European Event on the ApplicationNature-inspired Techniques for Telecommunication Networks and other Parallel and Distributed Systems, (**EvoCOMNET 2010**), 7 - 9 Apr 2010, Istanbul Technical University, Istanbul, Turkey

27. 8th International Conference on Computer Information Systems and Industrial Management Applications, (**CISIM 2009**), 9 - 11 - Dec 2009, Coimbatore, India

28. International Conference on Soft Computing and Pattern Recognition, (**SoCPar 2009**), 4 - 11 Dec 2009, Malacca, Malaysia

29. 2nd International Conference on Cognitive Neurodynamics, (**ICCN 2009**), 15 - 19 Nov 2009, Zhejiang University, Hangzhou, China

30. 3rd International Conference on Advanced Engineering Computing and Applications in Sciences, (**ADVCOMP 2009**), 11 - 16 Oct 2009, Sliema, Malta

31. IEEE Symposium on Computational Intelligence and Games, (**CIG 2009**), 7 - 10 Sep 2009, Milano, Italy

32. 2009 UK Workshop on Computational Intelligence, (**UKCI 2009**), 7 - 9 Sep 2009, University of Nottingham, Nottingham, UK

33. 4th Multidisciplinary International Conference on Scheduling : Theory and Applications, (**MISTA 2009**), 10 - 12 Aug 2009, Dublin, Ireland

    I am the program chair for this conference series.

34. VIII Metaheuristic International Conference, (**MIC 2009**), 13 - 16 Jul 2009, Hamburg, Germany

35. Genetic and Evolutionary Computation Conference, (**GECCO 2009**), 8 - 12 Jul 2009, Montreal, Canada

36. International Symposium on Scheduling 2009, (**ISS 2009**), 4 - 6 Jul 2009, Gokiso-cho, Showa-ku, Nagoya, Aichi, Japan

37. 6th International Conference on Informatics in Control (Automation and Robotics), (**ICINCO 2009**), 2 - 5 Jul 2009, Milan, Italy

38. 22nd International FLAIRS Conference, (**FLAIRS 2009**), 19 - 21 May 2009, Sanibel Island, Florida, USA. I was on the program committee of the Special Track on Artificial Intelligence Planning and Scheduling

39. 2009 IEEE Congress on Evolutionary Computation, (**CEC 2009**), 18 - 21 May 2009, Trondneim, Norway

40. 12th Advances in Computer Chess Conference, (**ACCC 2009**), 11 - 13 May 2009, Pamplona, Spain

41. 9th European Conference on Evolutionary Computation in Combinatorial Optimization, (EvoCOP 2009), 15 - 17 April 2009, Tubingen, Germany

42. 12th European Conference on Genetic Programming, (**EuroGP 2009**), 15 - 17 April 2009, Tubingen, Germany

43. 2009 IEEE Symposium on Computational Intelligence in Scheduling, (**CISched 2009**), 30 Mar - 2 Apr 2009, Nashville, USA

44. 24th Annual ACM Symposium on Applied Computing, (**SAC 2009**), 8 - 12 Mar 2009, Hawaii, USA

45. 2nd International Conference on Advances in Computer-Human Interactions, (**ACHI 2009**), 1 - 6 Feb 2009, Cancun, Mexico

46. International Conference on Agents and Artificial Intelligence, (**ICAART 2009**), 19 - 21 Jan 2009, Porto, Portugal

47. IEEE Symposium on Computational Intelligence and Games, (**CIG 2008**), 15 - 18 Dec 2008, Perth, Western Australia, Australia

48. 7th International Conference on Machine Learning and Applications, (**ICMLA 2008**), 11 - 13 Dec 2008, San Diego, California, USA

49. 8th International Conference on Intelligent Systems Design and Applications, (**ISDA 2008**), 26 - 28 Nov 2008, Kaohsiung, Taiwan

50. 5th International Conference on Soft as Transdisciplinary Science and Technology, (**CSTST 2008**), 26 - 28 Oct 2008, France

51. 2nd International Conference on Advanced Engineering Computing and Applications in Sciences, (**ADVCOMP 2008**), 29 Sep - 4 Oct 2008, Valencia, Spain

52. Computers and Games: 6th International Conference, (**CG 2008**), 29 Sep - 1 Oct 2008, Beijing, China

53. International Conference on Automated Planning and Scheduling, (**ICAPS 2008**), 14 - 18 Sep 2008, Sydney, Australia. I was a member of the Doctoral Consortium Committee

54. 10th International Conference on Parallel Problem Solving From Nature, (**PPSN 2008**), 13 - 17 Sep 2008, Dortmund, Germany

55. 4th International Conference on Natural Computation, (**ICNC 2008**), 25 - 27 Aug 2008, Jinan, China

56. Genetic and Evolutionary Computation Conference, (**GECCO 2008**), 12 - 16 Jul 2008, Atlanta, Georgia, USA

57. International Conference on Artificial Intelligence and Pattern Recognition, (**AIPR 2008**), 7 - 10 Jul 2008, Orlando, Florida, USA

58. IEEE International Conference on Cybernetics and Intelligent Systems, (**CIS 2008**), 3 - 6 Jun 2008, Chengdu, China

59. 2008 IEEE Congress on Evolutionary Computation, (**CEC 2008**), 1 - 6 Jun 2008, Hong Kong

60. 21st Florida Artificial Intelligence Research Society, (**FLAIRS 2008**), 15 - 17 May 2008, Coconut Grove, Florida, USA

61. 5th International Conference on Informatics in Control (Automation and Robotics), (**ICINCO 2008**), 11 - 15 May 2008, Funchal, Madeira, Portugal

62. European Symposium on Artificial Neural Networks (Advances in Computational Intelligence and Learning), (**ESANN 2008**), 23 - 25 Apr 2008, Bruges, Belgium

63. 11th European Conference on Genetic Programming, (**EuroGP 2008**), 26 - 28 Mar 2008, Napoli, Italy

64. 8th European Conference on Evolutionary Computation in Combinatorial Optimisation, (**EvoCOP 2008**), 26 - 28 Mar 2008, Napoli, Italy

65. 23rd Annual ACM Symposium on Applied Computing, (**SAC 2008**), 16 - 20 Mar 2008, Forteleza, Ceara, Brazil

66. 1st International Conference on Advances in Computer-Human Interaction, (**ACHI 2008**), 10 - 15 Feb 2008, St. Luce, Martinique

67. 26th Workshop of the UK Planning and Scheduling Special Interest Group, (**PlanSIG 2007**), 17 - 18 Dec 2007, Prague, Czech Republic

68. 3rd Indian International Conference on Artificial Intelligence, (**IICAI 2007**), 17 - 19 Dec 2007, Pune, India

69. 6th International Conference on Machine Learning and Applications, (**ICMLA 2007**), 13 - 15 Dec 2007, Cincinnati, Ohio, USA

70. 1st International Conference on Cognitive Neurodynamics, (**ICCN 2007**), 17 - 21 Nov 2007, Shanghai, China

71. CAEPIA 2007 Workshop on Planning (Scheduling and Constraint Satisfaction), (**CAEPIA 2007**), 13 Nov 2007, Salamanca, Spain

72. 1st International Conference on Advanced Engineering Computing and Applications in Sciences, (**ADVCOMP 2007**), 4 - 9 Nov 2007, Papeete, French Polynesia, Tahiti

73. 7th International Conference on Intelligent System Design and Applications, (**ISDA 2007**), 1 - 3 Oct 2007, Rio de Janeiro, Brazil

74. 2007 IEEE Congress on Evolutionary Computation, (**CEC 2007**), 25 - 28 Sep 2007, Singapore

    I was one of the six Technical Program Chairs for this conference

75. International Conference on Automated Planning and Scheduling, (**ICAPS 2007**), 22 - 26 Sep 2007, Providence, Rhode Island, USA

76. 3rd Multidisciplinary International Conference on Scheduling : Theory and Applications, (**MISTA 2007**), 28 - 31 Aug 2007, Paris, France

    I am the program chair for this conference series.

77. 3rd International Conference on Natural Computation, (**ICNC 2007**), 24 - 27 Aug 2007, Haikou, China

78. 22nd National Conference on Artificial Intelligence, (**AAAI 2007**), 22 - 26 Jul 2007, Vancouver, British Columbia, Canada

79. 2007 International Conference on Artificial Intelligence and Pattern Recognition, (**AIPR 2007**), 9 - 12 Jul 2007, Orlando, Florida, USA

80. Genetic and Evolutionary Computation Conference 2007, (**GECCO 2007**), 7 - 11 Jul 2007, University College London, UK

81. 4th International Conference on Informatics in Control (Automation and Robotics), (**ICINCO 2007**), 9 - 12 May 2007, Angers, France

82. 7th European Conference on Evolutionary Computation in Combinatorial Optimisation, (**EvoCOP 2007**), 11 - 13 Apr 2007, Valencia, Spain

83. 10th European Conference on Genetic Programming, (**EuroGP 2007**), 11 - 13 Apr 2007, Valencia, Spain

84. IEEE 2007 Computational Intelligence in Scheduling Symposium, (**CISched 2007**), 1 - 5 Apr 2007, Honolulu, Hawaii, USA. The conference was held as part of the 2007 IEEE Symposium on Computational Intelligence (SSCI 2007)

    I was one of the co-chairs of this conference.

85. 2007 IEEE Symposium on Computational Intelligence and Games, (**CIG 2007**), 1 - 5 Apr 2007, Honolulu, Hawaii, USA. Held in Conjunction with 2007 IEEE Symposium on Computational Intelligence (SSCI 2007)

86. 2007 IEEE Conference on Artificial Life, (**ALife 2007**), 1 - 5 Apr 2007, Honolulu, Hawaii, USA. Held in Conjunction with 2007 IEEE Symposium on Computational Intelligence (SSCI 2007)

87. 5th International Conference on Machine Learning and Applications, (**ICMLA 2006**), 14 - 16 Dec 2006, Sheraton World Resort, Orlando, Florida, USA

88. 25th Workshop of the UK Planning and Scheduling Special Interest Group, (**PlanSIG 2006**), 14 - 16 Dec 2006, Nottingham, UK

89. 18th IEEE International Conference on Tools with Artificial Intelligent, (**ICTAI 2006**), 13 - 15 Dec 2006, Washington DC, USA

90. 19th Australian Joint Conference on Artificial Intelligence, (**AI 2006**), 4 - 8 Dec 2006, Hobart, Tasmania, Australia

91. Nature Imitation Methods - Theory and Practice, (**NIM 2006**), 16 - 18 Oct 2006, Jinan, Shandong, China

92. 6th International Conference on Simulated Evolution and Learning, (**SEAL 2006**), 15 - 18 Oct 2006, Hefei, China

93. 2nd International Conference on Natural Computation, (**ICNC 2006**), 24 - 28 Sep 2006, Xidian, China

94. 9th International Conference on Parallel Problem Solving From Nature, (**PPSN 2006**), 9 - 13 Sep 2006, Reykjavik, Iceland

95. International Conference on Business and IT 2006, (**BIZIT 2006**), 8 - 10 Aug 2006, Universiti Teknologi MARA, Malaysia

96. 3rd International Conference on Informatics in Control (Automation and Robotics), (**ICINCO 2006**), 1 - 3 Aug 2006, Setubal, Portugal

97. International Symposium on Scheduling 2006, (**ISS 2006**), 18 - 20 Jul 2006, Tokyo, Japan

98. 2006 IEEE Congress on Evolutionary Computation, (**CEC 2006**), 16 - 21 Jul 2006, Vancouver, British Columbia, Canada

    I was one of the six Technical Program Chairs for this conference

99. 6th International Conference on Recent Advances in Soft Computing, (**RASC 2006**), 10 - 12 Jul 2006, Canterbury, UK

100. Genetic and Evolutionary Computation Conference 2006, (**GECCO 2006**), 8 - 12 Jul 2006, Seattle, WA, USA

101. 2006 IAENG International Workshop on Operations Research, (**IWOR 2006**), 20 - 22 Jun 2006, Hong Kong. This is part of the International Multi Conference Engineers and Computer Scientists 2006 (IMECS'06)

102. 2006 IEEE International Conferences on Cybernetics & Intelligent Systems, (**CIS 2006**), 7 - 9 Jun 2006, Bangkok, Thailand

103. International Conference on Automated Planning & Scheduling 2006, (**ICAPS 2006**), 6 - 10 Jun 2006, Ambleside, Cumbria, UK

104. Computers and Games: 5th International Conference, (**CG 2006**), 29 - 31 May 2006, Turin, Italy

105. IEEE Symposium on Computational Intelligence and Games, (**CIG 2006**), 22 - 24 May 2006, Reno, Nevada, USA

    I was also the co-chair (with Sushil Louis) of this conference

106. 7th International Conference on Adaptive Computing in Design and Manufacture, (**ACDM 2006**), 25 - 27 Apr 2006, Clifton, Bristol, UK

107. 9th European Conference on Genetic Programming, (**EuroGP 2006**), 10 - 12 Apr 2006, Budapest, Hungary

108. 6th European Conference on Evolutionary Computation in Combinatorial Optimisation, (**EvoCOP 2006**), 10 - 12 Apr 2006, Budapest, Hungary

109. 2nd Indian International Conference on Artificial Intelligence, (**IICAI 2005**), 20 - 22 Dec 2005, Pune, India

110. International Conference on Machine Learning and Applications, (**ICMLA 2005**), 15 - 17 Dec 2005, Los Angeles, California, USA

111. 18th Australian Joint Conference on Artificial Intelligence, (**AI 2005**), 5 - 9 Dec 2005, Sydney, Australia

112. 2nd International Conference on Artificial Life, (**ACAL 2005**), 5 - 7 Dec 2005, Sydney, Australia

113. 2005 ICSC Congress on Computational Intelligence Methods and Applications, (**CIMA 2005**), 2 - 14 Dec 2005, Istanbul, Turkey. Part of the first International ICSC Symposium on Advanced Computing in Financial Markets (ACFM 2005)

114. 3rd Annual International Conference in Computer Game Design and Technology, (**GDTW 2005**), 8 - 9 Nov 2005, Liverpool, UK

115. 1st International Conference on Natural Computation, (**ICNC 2005**), 27 - 29 Sep 2005, Changsha, China

116. International Conference on Informatics in Control (Automation and Robotics), (**ICINCO 2006**), 14 - 17 Sep 2005, Barcelona, Spain

117. International Computer Games Association Conference, (**ICGA 2005**), 3 - 9 Sep 2005, Taipei

118. 2005 IEEE Congress on Evolutionary Computation, (**CEC 2005**), 2 - 5 Sep 2005, Edinburgh, Scotland, UK

    I also co-organised, with Sushil Louis, a special session at this conference entitled Evolutionary Computation and Games

119.  6th Metaheuristics International Conference, (**MIC 2005**), 22 - 26 Aug 2005, Vienna, Austria

120.  4th International Workshop on Computational Intelligence in Economics and Finance, (**CIEF 2005**), 21 - 26 Jul 2005, Salt Lake City, USA

121.  2nd Multidisciplinary International Conference on Scheduling : Theory and Applications, (**MISTA 2005**), 18 - 21 Jul 2005, New York, USA

     I am the program chair for this conference series.

122.  Genetic and Evolutionary Computation Conference 2005, (**GECCO 2005**), 25 - 29 Jun 2005, Washington DC, USA

123.  International Digital Games Research Conference, (**DiGRA 2005**), 16 - 20 Jun 2005, Vancouver, British Columbia, Canada

124.  OR Practice in Africa, (**ORPA 2005**), 7 - 8 Apr 2005, Ouagadougou, Burkina Faso

125.  IEEE Symposium on Computational Intelligence and Games, (**CIG 2005**), 4 - 6 Apr 2005, Essex, UK

     I was also the co-chair (with Simon Lucas) of this conference

126.  5th European Conference on Evolutionary Computation in Combinatorial Optimization, (**EvoCOP 2005**), 30 Mar - 1 Apr 2005, Lausanne, Switzerland

127.  5th European Conference on Genetic Programming, (**EuroGP 2005**), 30 Mar - 1 Apr 2005, Lausanne, Switzerland

128.  20th ACM Symposium on Applied Computing, (**SAC 2005**), 13 - 17 Mar 2005, Santa Fe, New Mexico, USA

129.  5th International Conference in Soft Computing, (**RASC 2004**), 16 - 18 Dec 2004, Nottingham, UK

130.  2004 International Conference on Machine Learning and Applications, (**ICMLA 2004**), 16 - 18 Dec 2004, Louisville, KY, USA

131.  17th Australian Joint Conference on Artificial Intelligence, (**AI 2004**), 6 - 10 Dec 2004, Cairns, Australia

132.  2nd Annual International Workshop in Computer Game Design and Technology, (**CDGT 2004**), 15 - 16 Nov 2004, Liverpool John Moores University, UK

133.  2004 workshop on the Design and Evaluation of Advanced Hybrid Meta-Heuristics, (**DEAHM 2004**), 3 - 4 Nov 2004, Nottingham, UK

134.  8th International Conference on Parallel Problem Solving from Nature, (**PPSN 2004**), 18 - 22 Sep 2004, Birmingham, UK

135.  9th International Conference on Simulation and SynthesisLiving Systems, (**ALife 2004**), 12 - 15 Sep 2004, Boston, USA

136.  2004 IEEE Conference on Cybernetics and Intelligent Systems, (**CIS 2004**), 1 - 3 Sep 2004, Singapore

137.  International Conference on Knowledge Engineering and Decision Support, (**ICKEDS 2004**), 19 - 23 Jul 2004, Porto, Portugal

138.  Computers and Games: 4th International Conference, (**CG 2004**), 5 - 7 Jul 2004, Bar-Ilan University, Ramat-Gan, Israel

139.  Genetic and Evolutionary Computation Conference, (**GECCO 2004**), 26 - 30 Jun 2004, Seattle, Washington, USA

140.  2004 IEEE Congress on Evolutionary Computation 2004, (**CEC 2004**), 19 - 23 Jun 2004, Portland, Oregon, USA

     I also co-organised, with Simon Lucas, a special session at this conference entitled Evolutionary Computation and Games

141.  Second International Symposium on Scheduling in Japan, (**ISS 2004**), 24 - 26 May 2004, Japan

142.  4th European Conference on Evolutionary Computation in Combinatorial Optimization, (EvoCOP 2004), 5 - 7 Apr 2004, Coimbra, Portugal

143.  ACM Symposium on Applied Computing (Evolutionary Computing and Optimization (ECO) stream), (**SAC 2004**), 14 - 17 Mar 2004, Nicosia, Cyprus

144.  2003 IEEE Congress on Evolutionary Computation, (**CEC 2003**), 8 - 12 Dec 2003, Canberra, Australia

145.  1st Australian Conference on Artificial Life, (**ACAL 2003**), 6 - 7 Dec 2003, Canberra, Australia

146.  1st Multidisciplinary International Conference on Scheduling : Theory and Applications, (**MISTA 2003**), 13 - 16 Aug 2003, Nottingham, UK

     I am the program chair for this conference series.

147. Genetic and Evolutionary Computation Conference, (**GECCO 2003**), 12 - 16 Jul 2003, Chicago, USA

I was the track chair of the co-evolution stream for this conference

148. International Conference on Artificial Intelligence, (**ICAI 2003**), 23 - 26 Jun 2003, Las Vegas, Nevada, USA

I organised a special session at this conference entitled Applications of AI in Finance & Economics at this conference

149. 2003 International Conference on Machine Learning and Applications, (**ICMLA 2003**), 23 - 24 Jun 2003, Los Angeles, California, USA

I organised a special session at this conference entitled (Co-)Evolutionary Machine Learning

150. 4th International Conference on Recent Advances in Soft Computing, (**RASC 2002**), 12 - 13 Dec 2002, Nottingham Trent University, Nottingham, UK

151. 8th International Conference on the Simulation and Synthesis of Living Systems, (**ALife 2002**), 9 - 13 Dec 2002, University New South Wales, Sydney, New South Wales, Australia

152. 3rd International Workshop on Memetic Algorithms, (**WOMA III**), 7 Sep 2002, Granada, Spain. Held in conjunction with the 7th International Conference on Parallel Problem Solving from Nature (PPSN VII), 7-11 September 2002

153. Computers and Games: 3rd International Conference, (**CG 2002**), 24 - 27 Jul 2002, Edmonton, Canada

154. 2002 IEEE Congress on Evolutionary Computation, (**CEC 2002**), 12 - 17 May 2002, Hilton Hawaiian Village Hotel, Honolulu, Hawaii, USA

I co-organised a special session on scheduling at this conference

155. 4th Metaheuristics International Conference, (**MIC 2001**), 16 - 20 Jul 2001, Porto, Portugal

156. International Conference on Artificial Intelligence, (**ICAI 2001**), 25 - 28 Jun 2001, Las Vegas, Nevada, USA

157. 2001 IEEE Congress on Evolutionary Computation, (**CEC 2001**), 27 - 29 May 2001, COEX Center, Seoul, Korea

I co-organised a session on scheduling at this conference

## 7.9. Other Committees

1. Committee Member of the Computational Intelligence Society's Technical Committee on Evolutionary Computation (2008-present)

2. Vice-Chair for Computational Intelligence Society's Technical Committee on Evolutionary Computation (2008)

3. Chair for Computational Intelligence Society's Technical Committee on Coevolution (2008)

## 7.10. Additional Information

In September 2009, I was asked to be part of a committee to investigate a plagiarism case involving the IEEE. I can provide more details (in confidence) if necessary.

## 7.11. Other Esteem Indicators

1. Invited Panel Member at the Transnational Higher Education Summit, 20-21 Oct 2011, Sari Pan Pacific Jakarta Hotel, Jakarta, Indonesia

2. Attendance at New Perspectives in Scheduling Theory, 9-14 Oct 2011, Hua Jia Shan Resort, Hangzou, China (Bender M., Blazewicz J., Pesch E., Trystram D. and Zhang G.). This is an invited only event which invites the top scheduling researchers in the world. I presented a paper entitled *Vehicle Routing Problems: Current and Future Datasets*.

3. Attendance at New Challenges in Scheduling Theory Workshop, 12-17 Sep 2010, Centre CNRS "La Villa Clythia", Frejus. This is an invited only event which invites the top scheduling researchers in the world. I presented a paper entitled *Sports Scheduling: Progress to Date and Work in Progress*.

4. Attendance at *New Challenges on Scheduling Theory*, 12 May – 16 May 2008, CIRM, Marseilles, France (Bender M, Blazewicz J, Pesch E, Trystram D and Zhang G (chairs)). This is an invited only event which invites the top scheduling researchers in the world. I presented a paper entitled *Further Experiments in Scheduling English Football Fixtures*.

5. Attendance at the Dagstuhl seminar (which are "invitation only" events aimed at the top researchers in the world) on *Cutting, Packing, Layout and Space Allocation* (Seminar 07112, Cutting, Packing, Layout and Space Allocation, 13-16 Mar 2007, Burke E.K., Daniels K, **Kendall G.** (co-chairs)).

6. Attendance at *Scheduling Algorithms for New Emerging Applications*, 29 May – 2 June 2006, CIRM, Marseilles, France (Bender M., Blazewick J., Pesch E. and Trystram D (chairs)). This is an invited only event which invites the top scheduling researchers in the world. I presented a paper entitled *Football Fixture Scheduling in England*.

7. Attendance at the Dagstuhl seminar (which are "invitation only" events aimed at the top researchers in the world (only 2 people have been invited from the UK)).
*Scheduling in Computer and Manufacturing Systems (June 2004)*
*Organised by J. Blazewicz (Poznan UT, Poland), E. Coffman (New Jersey Inst. of Technology, USA), K. Ecker (TU Clausthal, Germany), D. Trystram (IMAG, Grenoble, France)*

8. Attendance at Dagstuhl seminar (which are "invitation only" events aimed at the top researchers in the world).
*Scheduling in Computer and Manufacturing Systems (2nd-7th June 2002)*
*Organised by J. Blazewicz (Poznan UT, Poland), E. Coffman (New Jersey Inst. of Technology, USA), K. Ecker (TU Clausthal, Germany), D. Trystram (IMAG, Grenoble, France)*

9. Attendance at New Trends in Scheduling Parallel and Distributed Systems, which is an invitation only conference (Luminy-Marseille, France, 1st-5th Oct 2001). At this conference I co-organised a session entitled "The Next Ten Years of Scheduling Research."

10. Chair of the organising committee of MISTA 2003 (The 1st Multidisciplinary International Conference on Scheduling : Theory and Applications) conference, 17th - 21st August 2003, The University of Nottingham, UK : E.K. Burke, G. Kendall, S Petrovic (editors). To appear in Kluwer.

11. Editor of ASAP Research Report 1999-2001, 2007-2009, 2009-2011. This 24 page brochure is a research report/marketing document for our research group.

12. External Examiner for Broxtowe College (2000-2001 and 2001-2002)

# 8.   Examining and Reviewing Duties

## 8.1.  External Examiner

1. External Assessor for *MSc Multidisciplinary Optimisation*, University of Birmingham, UK (Feb 2011)

2. External Assessor for *MRes Natural Computation*, University of Birmingham, UK (Jan 2011)

3. External Assessor for appointments in the Faculty of Computer Science and Information Technology, Universiti Putra Malaysia (October 2010 to September 2013)

4. Reviewer for the 2010 CPHC/BCS Distinguished Dissertations Competition

5. External Assessor for the promotion of academic staff for University of Khartoum, Sudan, 2010

6. External Assessor for the promotion of academic staff for Universiti Teknologi Mara, Malaysia, 2010

7. External Examiner for the University of Essex (2008/09 to 2011/12). This is a three year appointment. I am jointly responsible for examining 17 degree courses.

8. External Examiner (part of the supervisory committee) for Burak Bilgin, KaHo Sint-Lieven, Belgium (2008-2011)

9. External Examiner for Universiti Teknologi MARA, Malaysia (August 2006). This is a two year appointment (January 2006 to December 2007). I am responsible for examining 6 courses (CS220: *Bachelor of Science (Hons) (Information Technology)*; CS223: *Bachelor of Science (Hons) (Intelligent Systems)*; CS224: *Bachelor of Science (Hons) (Business Computing)*; CS226: *Bachelor of Science (Hons) (Information Systems Engineering)*; CS230: *Bachelor of Computer Science (Hons)*; CS777: *Master of Science (Computer Science)*))

10. In 2002 The University of Nottingham reached an agreement with The MISR International University (MIU), Egypt that involves the University of Nottingham acting as a mentor with the aim of ensuring that their undergraduate courses are of the same standard as those at the University of Nottingham. I was instrumental in establishing this link.

In November 2002 I visited MIU and carried out a quality assurance assessment. From this we developed an agreement which was signed in August 2003. I visit MIU twice a year (usually in July and October) in order to continue the assessment and also carry out undergraduate teaching and the supervision of student projects.

In April 2009 we signed a further MOA (for another five years) and in August 2009 we signed a 2+2 agreement with MISR. I led the negotiation on both the new agreements.

11. External assessor for a course (Certificate of Professional Development in Advanced Computing) at Liverpool John Moores University, UK. July 2004.

12. External assessor for a new BSc course (Artificial Intelligence with Robotics) at DeMontfort University, UK. May 2004

13. External Examiner for Honours Research Proposal for Edith Cowan University, Perth, Australia (January 2003)

## 8.2. PhD External Examiner

1. **Malek Ali Ahmad Fehaid**: Universiti Kebangsaan Malaysia, viva date Not Yet Known

2. **Ghaith Mohammad Jaradat**: Universiti Kebangsaan Malaysia, 25th January 2012

3. **Mohammed Abdo Saleh Hadwan**: Universiti Kebangsaan Malaysia, viva date, 18th November 2011

4. **Sadaf Naseem Jat**: Leicester University, viva date, 20th June 2011

5. **Colm O'Riordan**: University College Cork, viva date, 1st April 2011

6. **Arjun Chandra**: University of Birmingham, viva date, 1st February 2011

7. **Burak Bilgin**: Katholieke Universiteit Leuven, viva date, 20th December 2010

8. **Douglas Moody**: The City University of New York, viva date, 15th December 2010. Note: I was also his external supervisor, but was also required to sit on the defense panel.

9. **Roderick James Samuel Baker**: University of Bradford, viva date, 16th December 2010

10. **Jayrani Cheeneebash**: University of Mauritius, thesis report submitted 19th September 2010

11. **Waseem Shahzad**: FAST National University of Computer & Emerging Sciences, Pakistan, thesis report submitted, 31st July 2010

12. **Abel Garcia Najera**: University of Birmingham, viva date, 27th July 2010

13. **Manar Ibrahim Hosny**: Cardiff University, viva date, 3rd June 2010

14. **Mohamed Bahy Bader El Den**: University of Essex, viva date, 21st September 2009

15. **Alexandros Agapitos**: University of Essex, viva date, 19th August 2009

16. **Anna Syberfeldt**: De Montfort University, viva date, 28th January 2009

17. **Ziauddin Ursanni**: University of New South Wales, Australia, thesis report submitted, 25th May 2009

18. **Johnson Abraham**: University of the West of England, viva date, 7th August 2007

19. **Van Ha Do**: University of Technology Sydney, Australia, thesis report submitted, 19th February 2007

20. **Tim Gosling**: University of Essex, UK, viva date, 26th January 2007

21. **Sarah Steiner**: University College London, UK, viva date, 12th October 2006

22. **William Maden**: Lancaster University, UK, viva date, 14th September 2006

23. **James Philip Malburn Argyle**: University of Sheffield, UK, viva date, 30th March 2006

24. **Eliezer Kaplansky**: Ben-Gurion University of the Negev, Israel, thesis report submitted February 2006

25. **Luigi Barone**: University of Western Australia, Perth, Australia, thesis report submitted December 2002

## 8.3. MSc/MPhil External Examiner

1. **Julien Duhain** (MSc): University of Pretoria, South Africa. I was part of the examination committee. This committee met on 11th November 2011.

2. **Jacomine Grobler** (MSc): University of Pretoria, South Africa, viva date, 30th January 2009

3. **Himadri Bhattacharya** (MPhil): De Montfort University, viva date, 20th February 2007

4. **Cornelis Franken** (MSc): University of Pretoria, South Africa, thesis report submitted May 2004

## 8.4. PhD Internal Examiner

1. **Cheng Wai Kheng**: viva date, TBA

2. **Duc Thang Ho**: viva date, $2^{nd}$ November 2011

3. **Pawel Widera**: viva date, $10^{th}$ May 2010

4. **Geert de Maere**: viva date, $12^{th}$ January 2010

5. **Michael Stout**: viva date, $25^{th}$ June 2009

6. **Joseph Baxter**: viva date, $18^{th}$ March 2009

7. **James Goulding**: viva date, $16^{th}$ March 2009

8. **Bartosz Wietrzyk**: viva date, $7^{th}$ December 2007

9. **Julie Greensmith**: viva date, $18^{th}$ June 2007

10. **Jesús Dario Landa Silva**: viva date, $19^{th}$ August 2003

11. **Ralf Keuthen**: viva date, $23^{rd}$ September 2002

12. **Rong Qu**: viva date, $18^{th}$ October 2002

13. **Fatima Zohra Mansouri**: viva date, $20^{th}$ June 2001

## 8.5. MSc/MPhil/MRes Internal Examiner

1. **Martin Geiger** (MPhil): viva date, $22^{nd}$ June 2007

2. **Khoi Nguyen Le** (MRes): viva date, $18^{th}$ October 2006

## 8.6. International Research Reviewing

1. I was invited by Swiss National Science Foundation to act as a reviewer for one of their proposals (Title: *On the Computational Complexity of Optimization*, Value CHF 294,450), May 2008.

2. I was invited by the National Research Foundation of South Africa to review applications for their *Research Chairs Initiative*. This initiative aims to create 55 research chairs in the immediate future, with the ultimate goal of creating 210 research chairs by 2010. I was asked to review one of the applications for the very first phase (four chairs). The reviews were carried out in March/April 2006.

3. I was invited to carry out a review for The British Council, Poland (Title of Proposal: *Evolutionary games with nonlinear fitness functions related to simple large game structure and replicator dynamics and their applications to biological problems*, Value: ~£500)

4. I was invited to act as a reviewer for the Netherlands Organisation for Scientific Research (NWO) within the scope of their Innovative Research Incentives Scheme (Title of Proposal: *Adaptive Systems: Intelligence in Software Agents and Competitive Games*, Value: €1250K)

# 9. Administration

Since being appointed as a lecturer in the School of Computer Science I have undertaken a number of administration duties for the school.

- 2010 – present: Member of the University's Transnational Education Committee
- 2009 – present: Director of Internationalisation (this involves administering a budget of about ~£100,000 p.a. in order to support our internationalisation activities)
- 2006 – present: Member of the Schools' Management Board
- 2006 – present: Deputy Head of the Automated Scheduling, Optimisation and Planning (ASAP) Research Group.
- 2007 – 2008: Director of Research (and chair of Research Strategy Group)
- 2005 – 2007: Member of Research Strategy Group
- 2005 – 2009: Teaching Support Coordinator (this involves administering a budget of about ~£35,000 p.a. in order to support our teaching support activities)
- 2007 – 2008: Course Director for NG35 (MSc in Computational Finance)
- 2007 – 2008: Course Director for G400 (Computer Science)
- 2007 – 2008: Chair of the Undergraduate Staff Student Feedback Committee.
- 2005 – 2007 Line Manager for the Teaching Assistants within the school. When I took over this role we had 7 TA's within the school but this number has decreased in line with the fall in student numbers. I was given this role due to my previous managerial experience in industry.
- 2001 – 2003 Chair of the Undergraduate Staff Student Consultative Committee
- 1999 – 2001 Pastoral Care Officer

In addition, I carry out a number of administration duties within the research group, of which I am a member (ASAP : Automated Scheduling, Optimisation and Planning).
- I am deputy director of the Interdisciplinary Optimisation Laboratory (IOL). The IOL is a multi-disciplinary research centre at the University of Nottingham. It supports inter-disciplinary optimisation research across the fields of Computer Science, Chemistry, Engineering, Nursing, Built Environment, Medicine and Business. The lab is based on the Jubilee Campus and provides a framework and supportive environment in which to build on research collaborations in bio-informatics, scheduling, design and cognitive engineering.

# 10. Industrial Collaboration

- I am a director of two university spin out companies (Aptia Solutions Ltd and EventMap Ltd.). Both of these companies were formed following successful research which has now commercialised.
- I am the industrial coordinator for our research group.

# 11. Other Achievements

## Public Communication

Below I highlight some of the media exposure that my research has achieved. Due to the way *news* is disseminated, there will also be other examples of which I am unaware.

On 18th August 2010 New Scientist ran a feature on the IEEE Symposium on Computational Intelligence and Games conference. This was a conference that I started in 2005 (co-chaired with Simon Lucas from the University of Essex) and I also co-chaired the 2006 conference (with Sushil Louis from the University of Reno in Nevada).
See http://www.newscientist.com/article/mg20727745.100-online-games-are-a-gold-mine-for-design-ideas.html

On 13th August 2009 a brief report of my football scheduling research was reported in the Times Higher Education (University of Nottingham: Home Win, Times Higher Education 13 Aug 2009, pp 14). A copy of this article is available on request.

On 10th August 200 my research was featured on register.co.uk
(http://www.theregister.co.uk/2009/08/10/football_scheduler_ware_malarkey/). An image of this web page can be provided on request.

On 8th August 2009 my research was featured on Thaindian News (http://www.thaindian.com/newsportal/health/now-a-software-program-to-plan-english-football-fixtures_100229385.html). An image of this web page can be provided on request.

On 7th August 2009 my research was featured on Science Codex (http://www.sciencecodex.com/planning_english_football_fixtures). An image of this web page can be provided on request.

On 7th August 2009 I was interviewed by BBC Radio Nottingham about my research on scheduling football fixtures, particularly over the Christmas/New Year period. This was broadcast the following day (8th August 2009) to coincide with the start of the new football season.

On 7th August 2009, my research was reported at eurealert.org, reporting of my work with scheduling football fixtures (see http://www.eurekalert.org/pub_releases/2009-08/uon-pef080709.php).

On 6th August 2009, an article about my research appeared on physorg.com (http://www.physorg.com/news168796520.html). An image of this web page can be provided on request.

On 5th March 2008 our team were interviewed by BBC Radio Nottingham about the work we carried out in our robotics laboratory. I can supply electronic copies (as WAV files) of these interviews upon request.

I have organised a Public Communications Training Event (19th September 2006). This was organised under my own initiative and will utilise 8 EPSRC PCTF awards to leverage added value from these awards. The event has the following speakers; **Quentin Cooper** (Radio 4 presenter), **David Howard** (EPSRC Senior Media Fellow), **Jeremy Webb** (Editor of the New Scientist), **Joanna Coleman** (EPSRC), **Tara De Cozar** (UoN Media Relations), **Peter Higgins** (University of Essex), **Ed Copeland** (University of Nottingham), **Mark Griffiths** (Nottingham Trent University), **Noel Sharkey** (EPSRC Senior Media Fellow).

## Research Workshop

In 2005, I organised a two day workshop for members of the school to develop and peer review research proposals. This was very successful and one of those that attended commented "*It might be worth mentioning that this grant is a result of the exercise that Graham K. organized for helping younger researchers to write grants, so I wholeheartedly say that that event was \*very\* positive.*" This was after being awarded an EPSRC grant (EP/E017215/1: Semi)Formal Artificial Life Through P-systems & Learning Classifier Systems: An Investigation into InfoBiotics, £515K)

# 12. Research Interests

I have split this section into four sections: Cutting and Packing, Hyper-heuristics: Raising the Level of Generality, Scheduling and Adaptive Learning in Uncertain Environments.

## 12.1. Cutting, Packing and Space Allocation

This area was the topic of my PhD research and I have been developing it since that time. Below I present my major achievements.

We have published the (demonstrably) best algorithms in the world for packing rectangles and irregular shapes
- Burke E.K., Hellier R.S.R., Kendall G. and Whitwell G. Irregular Packing using the Line and Arc No-Fit Polygon. Accepted for Operations Research
- Burke E.K., Hellier R.S.R., Kendall G. and Whitwell. (2006) A New Bottom-Left-fill Heuristic Algorithm for the Two-Dimensional Irregular Packing Problem. Operations Research, 54(3), 587-601
- Burke E.K., Kendall G. and Whitwell G. A New Placement Heuristic for the Orthogonal Stock Cutting Problem. Operations Research, Volume 52, No. 4, pp 655-671, Jul-Aug 2004

I have a number of other journal papers (see above for conference papers) related to this area
- Ruibin B. and Kendall G. A Model for Fresh Produce Shelf Space Allocation and Inventory Management with Freshness Condition Dependent Demand. Accepted for INFORMS Journal on Computing.
- Dowsland K., Herbert E., Kendall G. and Burke E.K. Using Tree Search Bounds to Enhance a Genetic Algorithm Approach to Two Rectangle Packing Problems. European Journal of Operational Research (EJOR), Volume 168, Issue 2, 16 January 2006, Pages 390-402

I have a number of EPSRC awards within the domain of cutting and packing:
- EP/D031079/1:    NETWORK: Interdisciplinary Cutting, Packing and Space Allocation
- GR/R60577:        Investigate Novel Methods for Optimising Shelf Space Allocation
- GR/S52414/01:    An Investigation of Cutting/Packing and Planning using Automated Algorithm Selection
- GR/T26115/01:    Adaptive Multi-Objective Heuristic and Meta-heuristic Approaches to Space Allocation
- HIRF/084:          Commercialisation of Internationally Leading Cutting and Packing Technologies
- HIRF/084:          Decision Support for the Textile and Leather Industries - A HEROBC Innovation and Regional Fellowship (HIRF)
- TCS3047:           New Approaches to Produce Efficient Nesting Patterns
- CNA 00802329: Applying meta-heuristics and hyper-heuristics to stock cutting

I am guest editor of a forthcoming issue of *Annals of Operational Research* on "Cutting, Packing and Layout"

We have recently set up a spin off company (Aptia) in this area to exploit the advances we have made.

## 12.2. Hyper-heuristics: Raising the Level of Generality

One of the key aims of hyper-heuristics, is to raise the level of generality at which optimisation systems can operate. An objective is that hyper-heuristics will lead to more general systems that are able to handle a wide range of problem domains rather than current meta-heuristic technology which tends to be customised to a particular problem or a narrow class of problems. Hyper-heuristics are broadly concerned with intelligently choosing the right heuristic or algorithm in a given situation. Of course, a hyper-heuristic can be (often is) a (meta-)heuristic and it can operate on (meta-)heuristics..

We have a number of papers in this area (conferences papers are not listed but can be seen above).
- Burke E.K., Kendall G. and Soubeiga E. A Tabu-Search Hyper-Heuristic for Timetabling and Rostering. Journal of Heuristics, 9(6), 451-470, 2003
- Burke E., Hart E., Kendall G., Newall J., Ross P. and Schulenburg S. Hyper-Heuristics: An Emerging Direction in Modern Search Technology. Handbook of Meta-Heuristics (Glover F., ed), pp 457 – 474, Kluwer, 2003

I have a number of EPSRC awards within the domain of hyper-heuristics:
- EP/D027039/1:   Hyper-heuristics for Scheduling, Rostering and Routing: An International Collaboration: A Visiting fellowship (Michel Gendreau)

- GR/S70197/01:   PLATFORM: Towards More General Optimisation/Search Systems
- GR/N36837/01:   An Investigation of Hyper-Heuristic Methods

## 12.3. Adaptive Learning in Uncertain Environments

I hold a number of EPSRC awards in this area and it is an area that I would like to further develop in the future.

- I hold an EPSRC award (GR/S63465/01: *Prisoners Dilemma Competition: Celebrating the 20th Anniversary*) with Prof. Xin Yao at Birmingham that will celebrate the 20th anniversary of the Prisoners Dilemma competition run by Robert Axelrod. Axelrod has agreed to be a plenary speaker at the conference (CEC'04) (Congress on Evolutionary Computation 2004) and also to write a chapter for the planned book.
- I hold another EPSRC award (EP/C546024/1: *Symposium on Computational Intelligence & Games*) which supported the inaugural IEEE Computational Intelligence and Games conference that I co-chaired with Dr Simon Lucas (Essex). As part of this award we will submit an EPSRC Network proposal in this area.
- A further EPSRC award (EP/C546962/1: *Immersive Computing Games: A Visiting Fellowship*) supports a visiting fellow (Prof. Wang) from the Chinese Academy of Science (CAS). This award was made following a successful EPSRC INTERACT award (GR/S73150/01: *INTERACT CHINA: A New Research Collaboration between The University of China and the Chinese Academy of Science*) which allowed us to visit China in 2004 and establish the foundations for future collaboration.

Other activities in this area include

- I am Co-Chair and Co-Editor of the IEEE Symposium on Computational Intelligence and Games, April 4-6, 2005, Essex, UK, G. Kendall and S. Lucas (editors). To be published by IEEE. I will continue in this role for the 2005 conference (May 2005, Reno).
- I co-organised (with Simon Lucas) a special session at CEC'04 (Congress on Evolutionary Computation 2004), Portland, Oregon, USA, 19-23 June 2004. The session is entitled Evolutionary Computation and Games
- I am a guest Co-editor of a forthcoming issue of *Advances in Econometrics*  on "Applications of AI in Finance & Economics"
- Guest Co-editor (with J Schaeffer) of a forthcoming issue of *International Computer Games Association Journal* on Poker
- I have several PhD students working in these areas.

## 12.4. Scheduling

The ASAP research group is founded on its scheduling research. As such, I have an interest in this area as evidenced by the following.

- I am the chair of MISTA (Multidisciplinary International Conference on Scheduling : Theory and Applications) series of conferences. The first conference was held in August 2003 (in Nottingham). The second one was held in New York in 2005. The third is being planned for Paris in 2007. It is purposefully set at two yearly intervals as another conference that is run from within ASAP (PATAT: Practice and Theory of Automated Timetabling), is run in the even years.
- I have a strong interest in sports scheduling and have a growing reputation in this area after publishing a number of high profile papers. For example:
  - Kendall G., Knust S., Ribeiro C. C. and Urrutia S. (2010) *Scheduling in Sports: An Annotated Bibliography.* **Computers & Operations Research**, 37: 1-19 (doi:10.1016/j.cor.2009.05.013)
  - Kendall G. (2008) *Scheduling English Football Fixtures Over Holiday Periods*. **Journal of the Operational Research Society**, 59(6), 743-755 (doi:10.1057/palgrave.jors.2602382)
- I am a director of eventMap, which is a spin-off company which produces examination timetabling software (one of its cornerstone products is software developed within ASAP).
- I have several PhD students working in scheduling related areas.