Gautam Mitra

DATE OF BIRTH:	1 January 1941
FAMILY STATUS:	Married with one daughter (born 1977) and one son (born 1979)
LANGUAGES:	Fluent in English, Bengali; working knowledge of French and German
NATIONALITY:	British

1 EDUCATION

1965-1968	Ph.D. in Computational Methods in Operational Research. Institute of Computer Science (spin out of UCL) University of London.
1962-1964	M.Sc. in High Voltage Technique Queen Mary College (University of London).

1958-1962	B.E.E. degree in Electrical Engineering with First Class Honours. Recipient of Rector's prize for best all round graduate.Jadavpur University (Calcutta).

2 CAREER

2009	Appointed (honorary) Visiting Professor in the department of Computer Science, University College London (UCL)
2008	Appointed an Emeritus Professor in the department of Mathematical Sciences, Brunel University
2004	Awarded the title of 'Distinguished Professor'
2001-	Director of CARISMA: The Centre for the Analysis of Risk Optimisation and Modelling Applications. Departments' of Mathematical Sciences & Economics and Finance, Brunel University.
1991	Head of Department of Mathematics and Statistics, Brunel University.
1987	Professor of Computational Optimisation and Modelling, Brunel University, Department of Mathematics and Statistics.
1984	Director UNICOM Seminars.
1978	Reader, Brunel University, Department of Mathematics and Statistics. Responsible for research and courses in computational methods for operational research within the Department.
1974	Director UNICOM Consultants.
1973	Lecturer, Brunel University, Department of Statistics & Operational Research.
1971	International Computers Ltd., Linear Programming Consultant. Carried out the design of a new LP system for ICL 2900 computers; also taught part-time at the Queen Mary College, London University.
1969	Services in Informatics and Applications Ltd., 23 Ebury Street, London SW7. Worked as Senior Consultant in the Management Science Dept., and was the leader of the Anglo-French team on OPHELIE II LP.
1968	Scicon Ltd, Berners Street, London WC1. Worked for UMPIRE project implementing separable programming facility to Linear Programming code.
1965	Institute of Computer Science (University of London) Research Fellow, worked in the field of non-linear optimization techniques and published various research papers during this period.
1964	Atlas Computing Service. Wrote Survey Analysis and Transmission Line Design Program.

3 PUBLICATIONS

1. Detection and Measurement of Discharges in Gaseous Cavities in Solid Dielectrics Under Impulse Voltage Conditions. Proceedings of the IEE, vol.12, no.5, 1965, with B. Salvage (J)

2. Electric Stress in Circular Cylindrical Gaseous Cavity in a Solid Dielectric Axis of the Cylinder being Parallel to the Field. Proceedings of the IEE, vol.113, no.5, May 1966, with B. Salvage (J)

3. A Computer Technique for Optimizing the Sites and Heights for Transmission Towers - a Dynamic Programming Approach, Computer-Journal, 1969, with K. Wolfenden. (J)

4. A Computer Method for Designing the Optimum Vertical Profile of Highways - A Mathematical Programming Approach. Proceedings of the Conference on Computer Aided Design, Southampton, 1969 with V. Calogero. (C)

5. An Improved Algorithm for the Solution of Integer Programs by the Solution of Associated Diophantine Equations, French Journal R.I.R.O. no.1, 1970 with K. Wolfenden and D.B.C. Richards. (J)

6. Investigations of Some Branch and Bound Strategies for the Solution of Mixed Integer Linear Programs. Presented to the 7th International Symposium on Mathematical Programming, The Hague, 1970, Mathematical Programming Journal, 1973. (J)

7. Mathematical Programming Systems in Generation, Transmission and Distribution Planning. P.S.C.C. Conference, Grenoble, September 1972, with N. Adams, F. Belgaris and M. Laughton. (C)

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8. Analysis of Mathematical Programming Problems Prior to Applying the Simplex Algorithm. Mathematical Programming Journal, May 1975, with A.L. Brearley and H.P. Williams. (J)

9. Sparse Inverse in the Factored Form and Maintaining Sparsity During Simplex Iterations. Presented to IMA Conference on Software for Numerical Mathematics, April 1973, Loughborough. Published in Software for Numerical Mathematics Academic Press, D.J. Evans, Editor. (B)

10. Finding all the Vertices of a Convex Polyhedron. Presented to the International Conference on Operations Research, Bolyai Janos Mathematical Society, Budapest, 1974; published in the Proceedings, North Holland,1975, with G.R.Jahanshahlou. (C)

11. Chinese Representation of Integers and its Application in an Algorithm to find the Smith Normal Form of an Integer Matrix. Proceedings, Combinatorial Programming, 1977, held at Liverpool University, September 1977, with G.R. Jahanshahlou. (C)

12. An Exposition of (Linear) Complementarity Problem, International Journal of Mathematical Education for Science & Technology, 1979, vol.10, no.3. (J)

13. A multicriterion Stochastic Programming Model for Manpower Planning, Operations Research Verfarhen, Methods of Operations Research, vol.35, eds., W. Oettli & F. Steffens, Springer Verlag, 1979, with K.C. Chai. (C)

14. Linear Complementarity Problem and a Tree Search Algorithm for its Solution, Survey of Mathematical Programming, Ed. A. Prekopa, North Holland, 1979, vol.2, with G.R. Jahanshahlou. (B)

15. Matrix Generator Report Writer: MGRW 2900, Technical Publication 6908, ICL, 1979. (S)

16. An Investigation of Algorithms used in Restructuring of Linear Programming Basis Matrices Prior to Inversion, Studies on Graphs and Discrete Programming, Ed.P.Hansen, North Holland, 1981, with K. Darby-Dowman. (J)

17. A Computer Based Crew Scheduling System using a Mathematical Programming Approach Proceedings of the International Conference on Computer Scheduling of Public Transport (Leeds, July 1980), Ed. A. Wren, North Holland, 1981, with A.P. Welsh. (C)

18. UIMP: User Interface to Mathematical Programming. A mathematical programming language designed for ICL Ltd. and published by invitation in Transaction on Mathematical Software (TOMS), ACM, September 1982, with E.F.D. Ellison. (J)

19. Decision Support Systems for Public Transport Planning and Operations, Microcomputer Application in Developing Countries, Joint PTRC and British Computer Society Conference, Published by PTRC, July 1984, with K. Darby-Dowman and R.L. Lewis. (C)

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20. Cru-Sched - A computer based bus crew scheduling system using integer programming (invited contribution) Proceedings on the Third International Workshop on Transit Vehicle and Crew Scheduling, 1983, Montreal, published by North Holland, 1985, with K. Darby-Dowman. (B)

21. An Extension of Set Partitioning with Application to Scheduling Problems, European Journal of O.R.,vol.21,1985 with K. Darby-Dowman. (J)

22. Reformulation of Mathematical Programming Problems as Linear Complementarity Problems, in the Journal of Optimisation Theory and Application (JOTA), April 1988, with J. Judice. (J)

23. Linear, Integer, Separable and Fuzzy Programming Problems: A Unified Approach Towards Reformulation, Journal of the Operational Research Society, vol.39, No.2, pp 161-171 1988, with K. Darby-Dowman, C. Lucas and J. Yadegar. (J)

24. Computer Assisted Mathematical Programming (Modelling) System: CAMPS, The Computer Journal, vol.31,No.4, 1988, with C. Lucas. (J)

25. An Experimental Investigation of an Interior Search Algorithm within a Simplex Framework, in the Communications of the Association of Computing Machinery, December 1988, with M. Tamiz and J. Yadegar. (J)

26. A Hybrid Algorithm for Linear Programming, special issue on Simulation and Optimisation of Large Systems, Institute of Mathematics and Its Application, Oxford University Press, February 1988 with M. Tamiz and J. Yadegar. (C)

27. Mathematical Programming Modelling Systems, Guest Ed. Mitra, Special issue of IMA Journal of Mathematics in Management, vol.1, No.2 and No.4, 1987. (J)

28. Computer Assisted Modelling and Analysis of Linear Programming Problems: Towards a Unified Framework, IMA Journal of Mathematics in Management, (see 27 above) with C. Lucas and H. Greenberg, 1987. (J)

29. Mathematical Models for Decision Support, invited contribution in Encyclopedia of Computer Science and Technology, Marcel Dekker, 1988, edited by Allen Kent. (B)

30. An Enumerative Method for the Solution of Linear Complementarity Problems, European Journal of OR, vol.36,No.1,p122-128,1988,with J. Judice. (J)

31. An Integrated Decision Support System for Public Transport Operations, in Computer Aided Transport Scheduling, eds. J.R. Daduna and A. Wren, Springer Verlag, 1988, with K. Darby-Dowman and R.L. Lewis. (C)

32. Unsymmetric Sparse Linear Equation Solver by the Envelope Method: SPLNEQ, Software Section, Operations Research Letters, 1988, with J. Judice and M. Tamiz. (J)

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33. Tools for Modelling Support and Construction of Optimisation Applications, in Impact of Recent Computer Advances in Operations Research, R. Sharda, editor, North Holland, 1989. (C)

34. Alternative Methods for Representing the Inverse of Linear Programming Basis Matrices, presented to the 13th Internatinal Mathematical Programming Symposium, Tokyo, in Recent Developments in Mathematical Programming, Santosh Kumar (editor) Gordon & Breach, 1989, pp.273-302, G. Mitra and M. Tamiz. (B)

35. Set Covering and Set Partitioning: A Collection of Test Problems, in OMEGA, International Journal of Management Science Vol.18, No.2, pp.195-201, 1990, G. Mitra and E. El-Darzi. (J)

36. A Tree Search Approach for the Solution of Set Problems Using Alternative Relaxations, in proceedings of European Conference for Mathematics in Industry, editor J. Marley et al, Kluwer 1990, G. Mitra and E. El-Darzi. (C)

37. Solution of Large Sparse Symmetric Equations on a Transputer Network, Application 91: Glasgow 28-30 August 1991, T.S. Dourani, (editor) pp. 105-110, Applications of Transputers 3, IOS Press, R. Levkovitz and G. Mitra. (C)

38. Solution of Set Problems Using Assignment Relaxation, J. Opl.Res.Soc, in the special issue of JORS in honour of Ailsa Land, Vol.43,No.5, 1992, pp.483-493, G. Mitra and E. El-Darzi. (J)

39. The Scheduling of Sparse Matrix-Vector Multiplication on a Massively Parallel DAP Computer, presented at ICIAM Conference Washington, 1992, Parallel Computing 18, pp.675-697, June 1992, North Holland, J. Andersen, G. Mitra and D. Parkinson. (J)

40. Adapting the Interior Point Method for The Solution of Linear Programs on High performance computers, Computer Science and Operations Research, New Developments in their Interfaces, O. Balci Editor, 1992, pp. 73-86, Pergamon Press, G. Mitra, J. Andersen and R. Levkovitz. (C)

41. The Interior Point Method for LP on Parallel Computers, In Systems Modelling and Optimization, LNCIS180, summer 1992, pp. 241-250, P. Kall, (editor) Springer Verlag, G. Mitra, J. Andersen and R. Levkovitz. (C)

42. Cholesky Factorization of Sparse Symmetric Positive Definite Matrices on Distributed Parallel Computers, in Transputing in Numerical and Neural Network Applications, G.L.Reijns and J. Luo, (editors) 1992, pp. 30-46, IOS Press, R. Levkovitz and G. Mitra. (C)

43. Solution of Large Scale Linear Programs, a Review of Hardware Software and Algorithmic Issues, Optimisation in Industrial Environments, T. Ciriani and R. Leachman, (editors) Autumn 1993, pp.139-171, John Wiley, G. Mitra and R. Levkovitz. (B).

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45. Tools for Reformulating Logical Forms into Zero-One Mixed Integer Programs (MIPS), European Journal of Operational Research, Vol.72, No.2, 1994, pp.262-276, Jan. North Holland, G. Mitra, C. Lucas, S. Moody and E. Hadjiconstantinou. (J)

46. Solving Large Scale Linear Programming Problems Using an Interior Point Method on a Massively Parallel SIMD Computer, Journal of Parallel Algorithms and Applications, Vol.4, No.3 & 4, pp.301-306, 1994, H. Hafsteinsson, R. Levkovitz, G. Mitra. (J)

47. Sets and Indices in Linear Programming Modelling and their Integration with Relational Data Models, Computational Optimization and Applications, 4, 1995, pp.263-283, G. Mitra, C. Lucas, S. Moody and B. Kristjansson. (J)

48. Intelligent scheduling support for the United States Coast Guard, in Intelligent Scheduling Systems, D.E. Brown and W.T. Scherer, (editors), Kluwer Academic Publishers, (Operations Research/Computer Science Interfaces Series), 1995, pp.227-248, K. Darby-Dowman, C. Lucas, G. Mitra and R. Fink. (B)

49. Experimental Investigations in Combining Primal Dual Interior Point Method and Simplex Based LP Solvers, Annals of OR, Vol.58, pp.19-38, 1995, R. Levkovitz, G. Mitra. (J)

50. Maritime Scheduling Using Discrete Optimization and Artificial Intelligence Techniques, in Industrial Applications of Optimization, A. Sciomachen, (editor) John Wiley and Sons, Chapter 1, pp.1-17, 1995, G. Mitra, K. Darby-Dowman, C. Lucas, J.W. Smith. (B)

51. An Intelligent System for U.S. Coast Guard Cutter Scheduling, in European Journal of Operational Research, Vol. 87, No.3, pp.574-585, 1995, K. Darby-Dowman, R.E. Fink, G. Mitra and J. Smith (J)

52. Finding Better Starting Bases for the Simplex Method, in P. Kleinschmidt, (editor) SOR'95, Springer-Verlag, pp.7-12, 1995, I.Maros, G. Mitra. (C)

53. Simplex Algorithms, Chapter 1 in Recent Advances in Linear and Integer Programming, J. Beasley (editor), Oxford University Press, pp.1-46, 1996, I. Maros, G. Mitra (B)

54. Graph Theoretic Relaxations of Set Covering and Set Partitioning Problems, in European Journal of Operational Research, Vol.87, No.16, 1996 pp.109-121, G. Mitra, E. El-Darzi (J).

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55. A Fortran Based Mathematical Programming System: FortMP, User Manual, Brunel University and NAG Ltd, version 1.0, January 1994, E.F.D. Ellison, M. Hajian, R. Levkovitz, I. Maros, G. Mitra and D. Sayers. Revised August 1995, version 1 Revised March 1997, version 2. (S)

56. Data and Optimisation Modelling Tool for Elicitation and Browsing (DOME), in Interfaces in Computer Science and Operations Research: Advances in Metaheuristics, Optimization and Stochastic Modelling Technologies, Edited by R.S. Barr, R.V. Helgason., J.L. Kennington, Kluwer Academic Publishers, pp.297-324, 1996, H. Mousavi, G. Mitra, C. Lucas (C)

57. Solution of a Dynamic Non-Linear Robot Assignment Problem, in “Essays in Honour of Bjorn Nygreen”, edited by Einar Mastson, Asgeir Tomasgard, Eli Meistad, Shane Dye, Department of Managerial Economics and Operations Research, NTNU,

Trondheim, 1997, pp. 49-60, Sampo Ruuth, Istvan Maros, Gautam Mitra, Cormac Lucas.(B)

58. Risk and Return Analysis of a Multi-Period Strategic Planning Problem, in Stochastic Modelling in Innovative Manufacturing, Edited by A.H. Christer, S. Osaki and L.C. Thomas, Springer-Verlag, 1996, pp. 81-96. C. Lucas, E. Messina, G. Mitra (C).

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60. Constraint Logic Programming and Integer Programming Approaches and their Collaboration in Solving an Assignment Scheduling Problem, in Journal of CONSTRAINTS, Vol.1, No.3, pp.245-264, 1997, Kluwer Academic Publishers, K. Darby-Dowman, J. Little, G. Mitra, M. Zaffalon. (J)

61. A Model for Strategic Planning Under Uncertainty, in TOP, Journal of the Spanish OR Society, Vol.4, No.2, pp.361-384, 1996, P. Baricelli, C. Lucas, E. Messina, G. Mitra (J).

62. Strategies for Creating Advanced Bases for Large Scale Linear Programming Problems, INFORMS Journal on Computing, USA, Vol 10, No2, pp248-260, 1998, I. Maros, G. Mitra (J).

63. Modelling and Analysis of Multistage Stochastic Programming Problems: a Software Environment, in European Journal of Operational Research, pp. 343-359, 1997, Elsevier Press, E. Messina, G. Mitra (J)

64. Modelling of augmented makespan problems (AMAPS): Computational experience of applying integer presolve at the modelling stage, Annals of OR, Optimization and Modelling in memory of Aasa Hallefjord, S.W. Wallace, Editor, Vol.82, pp269-288, 1998, Baltzer Press, P, Baricelli, G. Mitra, B. Nygreen (J).

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J = Journal, S = Software Manual)***

65. A Parallel Implementation of the Maximum Likelihood Method in Positron Emission Tomography Image Construction, Vol 31, pp417-439, 1999, Computational Statistics and Data Analysis Journal, special issue “Parallel Processing and Statistics, H. Jones, G. Mitra, D. Parkinson, T. Spinks (J).

66. Adapting On-line Analytical Processing (OLAP) for Decision Modelling, Vol.26, pp1-30, 1999, Decision Support Systems. N. Koutsoukis, G. Mitra, C Lucas. (J)

67. Investigating the Sparse Simplex Algorithm on a Distributed Memory Multiprocessor, Vol26, pp151-170, 2000, Parallel Computing, I. Maros, G. Mitra.(J)

68. Constraint Classification, Proprocessing and a Branch and Relax Approach to Solving Mixed Integer Programming Models, Vol.2 No.1, pp1-45, 2000,

International Journal of Mathematical Algorithms, K. Kularajan, G. Mitra. F.Ellison, B. Nygreen(J)

69. Computational Solution of Capacity Planning Models Under Uncertainty, Vol.26, pp511-538, 2000, Parallel Computing, special issue on Economics, Finance and Decision-Making Elsevier Press (Editors: Erricos J. Kontoghiorghes, Anna Nagurney and Berc Rustem), S.A. Mirhassani, C. Lucas, G. Mitra, E. Messina. (J)

70. Detecting Embedded Networks in LP Using GUB Structures and Independent Set Algorithms, Vol.15, pp235-247, 2000 Journal of Computational Optimization and Applications, N Gulpinar, Z.G. Gutin, G. Mitra, I. Maros. (J)

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73. Computational Aspects of Alternative Portfolio Selection Models in the Presence of Discrete Asset Choice Constraints, Quantitative Finance Vol. 1. (2001) 1-13, N Jobst, M Horniman, C Lucas and G Mitra. (J).

74. An Application of Lagrangean Relaxation to a Capacity Planning Problem under Uncertainty, Journal of Operational Research Society, (52), p. 1256-1266, (2001), S.A.MirHassani, C.Lucas, C.A.Poojari, G.Mitra. (J)

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77. Creating Advanced Bases for Large Scale Linear Programs Exploiting Embedded Network Structure, Computational Optimization and its Applications (2002), pp 93. N Gulpinar, G Mitra, I Maros. (J)

78. Financial decision models in a dynamical setting: Special issue, Journal of Economics, Dynamics and Control, 2003, Guest Editors G Mitra and S Zenios (2003) p. 859-860 (J)

79. A Review of Portfolio Planning: Models and Systems, (2003) an invited chapter,

pp1 – 39 in: Advances in Portfolio Construction and Implementation, S E Satchell, A E Scowcroft (Eds.), Butterworth & Heinemann, Oxford. G

80. Asset and Liability Management using Stochastic Programming (2003), pp 295-308, Mitra, T Kyriakis, C Lucas. (B) in Asset and Liability Management Tools: A handbook of Best Practice, Edited by Bernd Scherer, publisher, RISK: Books, London. G Mitra, M Pirbhai, T Kyriakis. (B)

81. Extracting Pure Network Submatrices in Linear Programs using Generalized Signed Graphs, The Journal of Applied Discrete Mathematics, (2003), p.359-372. G.Gutin, N .Gulpinar, G.Mitra, A.Zverovich. (J)

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2. Mitra, L., Mitra, G., Sun, X., Roman, D. and Yu, K. (2008). Mixture distribution scenarios for investment decisions with downside risk. Available at: http://ssrn.com/abstract=1260228.
3. Yu, K., Sun, X. and Mitra, G. (2008). Nonparametric multivariate conditional distribution and quantile regression. Available at: http://ssrn.com/abstract=1264946
4. Yu, X., Mitra, G. and Yu, K. (2013). Impact of news on asset behaviour: Return, volatility and liquidity in an intra-day setting. Available at: http://ssrn.com/abstract=2296855
5. Mitra, G. and Yu, X. (2015). Progress in sentiment analysis applied to finance: An overview. Chapter 1 in Mitra, G. and Yu, X. (2015) "Handbook of Sentiment Analysis in Finance".

BOOKS

Authored:

B1. Theory and Application of Mathematical Programming, Academic Press, December 1976.

B2. Decision Modelling and Information Systems: The Information Value Chain, INFORMS Operations Research/ Computer Science Interfaces Series, publishers Kluwer Press, G Mitra, N Koutsoukis, (2003).

Edited:

B3. Computer Assisted Decision Making: expert systems, decision analysis, mathematical programming. Published by North Holland in August 1986 in their AI catalogue.

B4. Mathematical Models for Decision Support, Editor G. Mitra, in NATO Advanced Study Institute Series, 1988, by Springer Verlag.

B5. Annals of Operations Research, Vol.43, Applied Mathematical Programming and Modelling: APMOD91, Edited by G. Mitra and I. Maros, Baltzer AG Science Publishers, Switzerland, 1993.

B6. Annals of Operations Research, Vol.58, Applied Mathematical Programming and Modelling: APMOD93, Edited by G. Mitra and I. Maros, Baltzer AG Science Publishers, Switzerland, 1995.

B7. Annals of Operations Research, Vol.75, Applied Mathematical Programming and Modelling: APMOD95, Edited by G. Mitra, I. Maros and A. Sciomachen, Baltzer AG Science Publishers, Switzerland, 1997.

B8. Annals of Operations Research, Applied Mathematical Programming and Modelling: APMOD98, Edited by G. Mitra, I. Maros and H. Vladimirou, Baltzer AG Science Publishers, Switzerland, 2000 (now Kluwer Press)

B9. Annals of Operations Research, Applied Mathematical Programming and Modelling: APMOD2000, Edited by G. Mitra and I. Maros, Baltzer AG Science Publishers, Switzerland, 2002, (Now Kluwer Press)

B10 G. Mitra and K. Schwaiger (Editors). Asset and Liability Management: Handbook. Palgrave, April (2011)

B11 M A H Dempster, G. Mitra and G. Pflug (Editors) Quantitative Fund Management, Chapman Hall & C R C Press, (2009)

B12 G Mitra and L Mitra (Editors), Handbook of News Analytics in Finance, John Wiley ,(2011).

OTHER PAPERS AND REPORTS

R1. A Dichotomizing Procedure for the Fixed Charge Problem. Presented to the SIAM Conference on Optimisation, Institute of Computer Science, London University. Report 1968.

R2. Group Theory and Its Application to Mathematical Programming Technical Report STR/7, Dept of Stats and OR, Brunel Univ, 1975 with G.R. Jahanshalou.

R3. Review of Programming Models for Decision Making under Risk. Technical Report STR/11, Dept of Stats and OR, Brunel University, 1975 with K.C. Chai.

R4. Application of Mathematical Programming Techniques to Commercial Aircraft Scheduling, Technical Report STR/13, Dept of Stats and OR, Brunel University, 1976, with K.C.Chai.

R5. Computer Based Crew Scheduling System using Mathematical Programming: Some Experience of it Use, Proceedings of the 13th Annual Seminar on Public Transport, Operations Research (Leeds July 1981) with K. Darby-Dowman.

R6. Matrix Storage Schemes in Linear Programming, SIGMAP, Bulletin (ACM), 1983 with K. Darby-Dowman.

R7. CAMPS: Computer Assisted Mathematical Programming (Modelling) System. Reference Manual, with C. Lucas, July 1985.

R8. FORTLP: Fortran Based LP System, User Manual, with M. Tamiz and J. Yadegar, July 1985, revised June 1987.

R9. Development of the Linear and Integer Programming Package FORTLP on Micros Using MS DOS and MS FORTRAN - with J. Yadegar and M. Tamiz, April, 1985.

R10. A Tree Search Approach for the Solution of Set Problems Using Alternative Relaxations, with E. El-Darzi, TR/03/88, Brunel University, Dept. of Mathematics and Statistics, Technical Report, July 1988.

R11. A Program to Reorder and Solve Sparse Unsymmetric Linear Systems using the Envelope Method, Brunel Technical Report, TR/04/87 with J. Judice and M. Tamiz.

R12. An investigation of Pricing Strategies within Simplex, Brunel Report TR/02/87, with I. Rebelo and M. Tamiz.

4 RESEARCH PROGRAMME

Professor Mitra’s Research Interests:

Over The years Professor Mitra’s research interests have evolved. The research topics pursued and the calendar periods are set out below:

1967 – 1990: Computational algorithms for the solution of large scale linear and discrete optimization problems.

1978 – 1995: Computer assisted modelling of the above class of optimization problems

{ Professor Mitra was promoted to a chair in 1986:

Title: Professor of Computational Optimization and Modelling }

Some this research and publications had significant amount of traditional as well as emerging Computer Science: The topics include:

(i) Construction of compilers
(ii) Analysis of Declarative and Procedural Languages and their interaction in practice.
(iii) Overlap of first order logic, graph theory and discrete optimisation
(iv) Knowledge representation , model representation and their overlap with Artificial Intelligence and Expert Systems
(v) Parallel computing with SIMD and MIMD architectures

1995- present Interaction of Decision Modelling and Information Systems
Decision making under uncertainty [Stochastic Optimisation and Robust Optimisation]

2007- present Computational Behavioural Finance:

(i) Analysis of (news) sentiment and other social media sources.
(ii) Financial Analytics for quantitative fund management and automated trading.
(iii) Neo-classical models and methods of controlling down-side risk
(iv) Theory of market micro-structure and its application in
[a] automated (computer) trading and [b] control of liquidity risk

5 RESEARCH GRANTS AND CONTRACTS

1983 SERC contract: Jointly with Prof. M.A. Laughton (principal investigator), Queen Mary College, to investigate optimisation and expert systems in planning. £40,000 approximately.

1984 SERC contract: Large Scale Linear, Integer and Discrete Programming Problems: Software for Computational Solutions. £34,900.

1984 Brunel Brief Award to M. Tamiz for the Construction of FORTLP system £1,250.

1985 SERC visiting fellowship to J. Judice, Restructuring of the Basis Matrices to Block Diagonal and Band Diagonal Forms; their Application to LP. £3,910.

1985 SERC Instant Award: Computer Assisted Analysis and Modelling of Structured Problems, fellowship to C. Lucas started in February 1986, and completed in September 1986, £9,600.

1986 Trim Minimisation Problem Applied to Gaskets by Turner Newall (Cooper Payne, Slough), £1,600.

1986 Investigation of Linear Programming Pricing Strategy for Centre for World Food Studies, £750.

1986 NATO Advanced Study Institute, Mathematical Models for Decision Support, $38,000.

1986 US Army European Research Office, Computer Assisted Analysis and Modelling of Structured Problems, $99,675.

1986 SERC and Numerical Algorithms Group Collaborative Award, Large Scale Linear, Integer and Discrete Programming Problems, £52,400.

1987 Renewal with NATO collaborative research award to cover joint investigation with Professor H. Greenberg, University of Colorado, Denver, $8,600.

1988 Digital Equipment European External Research Programme: The Design of Sparse Linear Algebra Kernels and their Applications in Large Sparse Linear Programming Problems on High Performance Computers, total value £115,000.

1989 CASE Studentship EPSRC and AMT Ltd, £50,617.

1990 Brunel University research committee ‘seed corn’ fund for research , £12,500.

1991 Teaching Co. Scheme (DTI & EPSRC) with ISI group, £116,368.

1991 US Coast Guard, Cutter Scheduling project, $850,000.

1991 CASE Studentship EPSRC and NAG Ltd, £32,749.

1992 DTI Parallel Algorithms for LP with NAG as industry partner, £206,378

1992 Minverva Project MOD, £6,000.

1993 Electricity Contract Portfolio Optimization, Southern Electric, £30,000.

1994 Mixed Salvo Study of cooperative missile system, MOD £62,500.

1994 Human Capital Mobility, EU/ESPRIT, £15,832.

1994 CTI: USA and Hammersmith Hospital Parallel Pet Scan, £37,500.

1994 Superbus : Bus and crew scheduling, EU/ESPRIT project, with Dr K Darby-Dowman, £221,818.

1994 Modelling Uncertainty using mathematical programming, EU Fellowship for E Messina (University of Milan) Brunel, £51,700.

1995 TCS programme for LP algorithms in parallel computers, DTI and EPSRC, with TRANSTECH Parallel Systems, £320,647

1995 Strategic Resource Allocation Model under Uncertainty, UNILEVER Research, £125,000 over 5 years.

1996 ROPA: project Robust Optimization models under Uncertainty, EPSRC £68,041.

1995 Parallel Pet Scan (PARAPET), EU/ESPRIT FRAMEWORK IV project, £270,588. { Total Value of the project with 6 partners was £ 2,000,000 approximately. I acted as the major co-ordinator to initiate the project. The project management was then outsourced to an SME start-up in the domain of parallel computing }

1997 Supply Chain Uncertainty Management Network Optimization, EU/ESPRIT FRAMEWORK IV project £210,525.

1997 Flexible Dynamic Scheduling using parallel computing, EU ESPRIT project with Dr K Darby-Dowman, £83,880.

1997 Portfolio Planning and Financial Modelling, EPSRC CASE Studentship with APT Inc. £43,050.

1997 VC's discretionary research fund, £30,000 PhD student support.

1999 Fidelity Investment Services, 3 year PhD research, £75,000.

2000 TCS Programme, Interest Rate Modelling, £197,192 – with MB Risk Management.

2000 Portfolio Optimization using discrete quadratic programme, PhD research. UBS WARBURG, £75,000.

2000 Real Options and Stochastic Programming, UNILEVER Research, £45,000.

2000 EPSRC, Channel Assignment –workshop, with Dr S.D. Noble, £5,000.

2001 Research grant by INQUIRE to investigate Portfolio planning solution algorithms, £10,000.

2003 EPSRC, Visiting fellowship for Professor Suvrajeet Sen, £9,880.

2002 WEBOPT project funded by ASIA IT & C, Euro 400,000.

2003 EPSRC, ROPA, Valuation of strategic plans by real options and Stochastic Programming, £103,506.

2004 Industry sponsorship KIDDE plc, £100,000

2004 Case studentships to CARISMA 3 x £56,900 = £170,700

2005 ASIA-LINK project Euro 300,000

2005 KTP with Business School £125,000

2005 OptiRisk Systems Bursary £7,200

2006 British Petroleum Oil Trading Desk of Risk Control £75,000

2009 ESSRC wrote to Brunel University soliciting a project to be led by **me.** The scope of this pilot project was to investigate the use of Stochastic Optimisation (my area of expertise) in allocating budgets to NHS trusts. This was to be a pilot ; proof of concept (POC) to be followed up by a large scale project. Value of Pilot Project: £45,000.

OptiRisk Projects

Only projects funded by EU , EPSRC, or industry commissioned R&D projects are included in this part

1999 Optimisation Service Provision (OSP) Craft project of EU. Value €2,500,000 with four partners.

2007 R&D Project sponsored by UBS; NAG subsequently joined the project. Value £750,000

2009 Foresight Programme: Computer Trading in Financial Markets- The Next fifteen years Value £15,000 [UK Government Programme ; funded by the treasury and Bank of England]

2010 News Optimized Risk Modelling (NORM) project . Managing partner SEMLAB, Holland. { EU EUREKA office had told SEMLAB that a condition of approving the project is that OptiRisk must join the project due to our domain expertise }
Total Value: €2,094,007 ; Value to OptiRisk: €323,739

2011 Continuation and commercial exploitation of the KIDDE project with United Technologies (USA). Value further £175,000 for constructing a design tool based on the research results.

6 PROFESSIONAL ACTIVITIES

International Conferences

Professor Mitra initiated a series of international symposia:

APMOD (**AP**plied mathematical programming and **MOD**elling) is a series of conferences which was started in 1991 due to an initiative of Gautam Mitra at Brunel University/West London. This was then followed by a series of symposia which focussed on the evolving research problems in optimization modelling. These events were held in Budapest (1993), Brunel (1995), Limassol/Cyprus (1998), Brunel (2000), Varenna/Italy (2002), Brunel (2004), Madrid (2006), Vienna-Bratislava (2008), Paderborn (2012), Warwick BS (2014).

Professor Mitra has presented his work by invitation to:

NATO Advanced Study Institutes (various)
IBM Europe Institutes, 1991, 1992,
Plenary Address - National OR Conference, Slovenia 1999,
Plenary Address - National OR Conference, Italy 2000, Italy 2003,
Plenary Address – Dutch OR Society, 2003,
Various INFORMS meetings in the USA.

Membership of National and International Bodies

Professor Mitra is a member of the following professional societies.

1. Fellow of the British Computer Society.
2. Fellow of the Institute of Mathematics and its Applications.
3. Fellow of the Royal Society of Arts.
4. Fellow of the Royal Institution (RI) and member of the 14-10 Club

Professor Mitra is also a member of:

4. Operational Research Society (UK).
5. Association of Computing Machinery (USA).
6. Institute for Operational Research and Management Science: INFORMS.
7. Founder Member of Mathematical Programming Society (International).
8. He has been the Chairman of the Mathematical Programming Group (BCS) 1969-2000.

Editorships

a) Advisory Editor to ORSA Journal of Computing, a new journal launched by the OR Society of America 1987-1992.

b) Associate Editor of IMA Journal of Mathematics Applied in Business and Industry, Oxford University Press, UK. 1986-2000.

c) Associate Editor of Computational Optimization and Its Applications, Kluwer Academic Publisher, USA. 1991 onwards.

d) Series Editor of Technical Press-Unicom Applied Information Technology Series: Published 10 books, 1985-1990.

e) Series Editor of Kogan Page-Unicom series, 8 books commissioned, 1990-1992.

f) Annals of OR series on Applied Mathematical Programming and Modelling.

g) Associate Editor of the International Journal of Mathematical Algorithms. Gordon and Breach, Publishers.

Guest Editor of Special Issues

Special issue, Journal of Economics, Dynamics and Control,(2003)
Computational Optimisation and Its Applications (2005)
Computational Optimization and Its Applications (2005)
Quantitative Finance (2005)
Journal of Asset Management (2010)

Research Councils

Professor Mitra has been a member of :

(a) EPSRC Mathematics College (1995-96).
(b) EPSRC Mathematics and OR panel for grant review all through 1996.
(c) Re-elected a member of The EPSRC Mathematics College 2000 onwards.
(d) Serves on EPSRC grant review panel 2003, 2004, 2005.
(e) Acted as referee for:
NSF grant proposals (USA).
CNRS grant proposals (ITALY).
NSERC grant proposals (CANADA).
NATO Advanced Study Institutes grant proposals (BELGIUM).

External Examiners

(a) **DSc** Examiner: University of London, Leeds University.
(b) **PhD** Examiner:
Imperial College, Essex, Southampton, London School of Economics.
Examiner: University of Twente,

University of Valencia.
Instituto de Investigación Tecnológica, Universidad Pontificia Comillas,
Delft University of Technology
University of Madrid
Twente University
Alicante University
University of Padderborn
Warwick University (Business School)
Cambridge University (Judge Institute of Management)

EPA Jury

Invited to act as the Chairman of the Jury offering the prize **E**xcellence in **P**ractice **A**ward **(EPA)** This is a global initiative of the European OR society: EURO.

Parliamentary Committee

Member of the **Parliamentary and Scientific Committee** on Science and Industry
(Invited to join in April 2014)

7 POSTGRADUATE RESEARCH STUDENTS

Name	Degree	Date awarded
1. Gholam Reza Jahanshahlou	PhD	1977
2. Jose Calero-Lomelin	PhD	1978
3. Kee Cheong Chai	PhD	1978
4. Kenneth Darby-Dowman	PhD	1980
5. Junio Rico Guerrero	MPhil	1981
6. Joaquim Judice	PhD	1982
7. Elia El-Darzi	PhD	1987
8. Cormac Lucas	PhD	1987
9. Mehrdad Tamiz	PhD	1987
10. Mozafar Hajian	PhD	1992
11. Ron Levkovitz	PhD	1993
12. Ilan Hai	MPhil	1994
13. Shirley-Anne Moody	PhD	1994
14. Johannes Anderson	PhD	1995
15. Fatimah Abdul Hamid	PhD	1996
16. Mumtaz Hussain Mahar	PhD	1996

17. Emaldadin Hajian	MPhil	1997
18. S.M. Hossein Mousavi-Khalkhali	PhD	1998
19. Helen Mander Jones	PhD	1998
20. Nalan Gulpinar	PhD	1999
21. Nikitas-Spiros Koutsoukis	PhD	1999
22. Kulanathan Kularajan	PhD	2000
23. Michael Horniman	PhD	2001
24. Belen Dominguez-Ballesteros	PhD	2001
25. Vincent Nwana	PhD	2001
26. Triphonas Kyriakis	PhD	2002
27. Chandra Poojari	PhD	2002
28. Norbert Jobst	PhD	2002
29. Patrick Valente	PhD	2002
30. Mehndi Pirbhai	MPhil	2003
31. Marion Guertler	PhD	2003
32. Christos Siamitros	PhD	2004
33. Nico Di Domenica	PhD	2005
34. George Birbilis	PhD	2005
35. Manti Mendi	PhD	2005
36. Konstantin Volsov	PhD	2005
37. Diana Roman	PhD	2006
38. Frank Ellison	PhD	2007
39. Gianfranco Guastaroba	MPhil	2009
40. Katharina Schwaiger	PhD	2009
41. Michael (Xiaochen) Sun	PhD	2009
42. Christian Valente	PhD	2011
43. Sheikh Siti Hussin	PhD	2013
44. Nina Grishina(set research topic)	PhD	2014
45. Xiang Yu	PhD	2014