

Dr. G S R Murthy, Ph.D.

Senior Technical Officer

Indian Statistical Institute

Hyderabad, India



Educational Background

- Ph. D. from Indian Statistical Institute, India
Thesis title: Some contributions to the Linear Complementarity Problem
- PG Diploma, Master of Statistics, Bachelor of Statistics (Honours)
from Indian Statistical Institute, India
- Specialist Development Fellowship in Statistical Quality Control and Operations Research, Indian Statistical Institute.

Current Positions

- Senior Technical Officer (Professor equivalent), Indian Statistical Institute, Hyderabad
- Guest Faculty, University of Hyderabad
- Working Committee Member Statistics Olympiad, CRRao AIMSCS
- Member, Academic Council, Indian Statistical Institute
- Member, Signal Review Panel, Haemovigilance Programme of India, Ministry of Health & Family Welfare, India

Positions Held in the Past

- Member, Drugs Survey - Statistical Designs Committee, Ministry of Health & Family Welfare, India (2014-16)
- Convener, Ph.D./D.Sc. Committee (QR & OR), Indian Statistical Institute
- Head, SQC & OR Unit, Hyderabad (1999 - 2000)
- Member, Board of Studies in Statistics, Osmania University, Hyderabad (2006-09)
- Adjunct Professor, CR Rao AIMSCS, Hyderabad (2009)

- Member, Expert Committee for Statistics, IGNOU, New Delhi (2010)
- Subject Matter Expert to M/s Sankhya Infotech Limited (2001)
- Member of Evaluation Committee for Rajiv Gandhi National Quality Award, BIS (2007-2011)

Topics of Interest

- Mathematical Modelling for large scale live industrial problems
- Operations Research and Convex Optimization
- Linear Complementarity Problem
- Stochastic Dynamic Programming
- Multivariate Data Analytics and Simulation
- Industrial Statistical Applications

Consultancy and Research Projects

- Research Advisor
Thesis title: Mathematical formulations for complex scheduling problems
Scholar: T R Lalita (2014-2019)
Institute: Indian Statistical Institute
Ph.D. awarded in: January 2021
- Estimation of Gross Bet Value at Casinos, Client: Directorate General GST Intelligence, Govt. of India, Hyderabad.
- Designed the national drugs survey
- Working on Berth and crane allocation problems for ship yards.
- An Efficient Algorithm to the Integrated Shift and Task Scheduling Problem, Technical Paper, under review for publication with Journal of Scheduling.
- The Wind Power Scheduling Problem, consultancy project for a leading paper industry in India. The article to appear in Opsearch journal.

- Have been working as consultant to a variety of industries over the past 35 years. Some of the prestigious clients include: ITC, Bharath Biotech International Limited, Birla Tyres Limited, Dr. Reddys, APERC, DISCOMs, Sankhya Infotech, National Institute of Biologicals, etc.
- Currently working on optimization in airport operations. These include:
 - (i) Optimal allocation of check-in counters with huge number of counters and departures, (ii) Optimization of personal and task scheduling,
 - (iii) Assessment of collision risk of aircrafts flying in selected routes.

Important Contributions

1. Teaching MS and M. Sc. courses at Indian Statistical Institute and Central University of Hyderabad. Topics include Optimization Techniques (Linear Programming and Non-linear Programming), Statistics (Probability, Inference, Stochastic Processes, Design of Experiments); prepared course material and lecture notes on Statistics and OR topics for IGNOU.
2. Published a book with the leading international publisher **Springer** and contributed five chapters in another book also published by Springer.
3. Trained hundreds of industrial managers, executives and operators over the past three decades on Quality management tools and techniques.
4. Worked on a number of live industrial projects involving applications of Statistics and Operations Research. In particular, took special interest in promoting OR applications through live projects from industry.
5. Participated in a number of national and international conferences by presenting papers and serving as member of organizing/editorial committees. Organized a session on applications of Operations Research at Lehigh University, Bethlehem, USA.
6. Visited foreign universities and industries in connection with collaborative research and consultancy works.
7. Had the opportunity of visiting and assessing a large number of firms in the country, small to large scale firms, as a member of the Evaluation Committee for Rajiv Gandhi National Quality Award hosted by Bureau of Indian Standards.

Publications

Books

- Applications of Operations Research, Case Studies, G S R Murthy in the International Series on Operations Research and Management Science, 2015 (<http://www.springer.com/in/book/9783319179209>)
- Five chapters in the book: Applications of Optimal Decision Making, in the International Series on Operations Research and Management Science, 2015, edited by Katta G. Murty.
(<http://www.springer.com/gp/book/9781493910069>)

Journal Publications and Technical Reports

1. Autoantibody Clustering in Systemic Lupus Erythematosus Associated Pulmonary Arterial Hypertension, Ritasman Baisya, P K Devarasetti, G S R Murthy and Liza Rajasekhar, Indian Journal of Cardiovascular Disease in Women-WINCARS (2021), Vol.6: 100-105.
2. Compact ILP Formulations for a Class of Solutions to Berth Allocation and Quay Crane Scheduling Problems, Lalita, T. R., and G. S. R. Murthy, *OPSEARCH* (2021): 1-27.
3. The wind power scheduling problem, Lalita, T. R., and G. S. R. Murthy, *OPSEARCH* (2021): 1-25.
4. Mathematical formulations for large scale check-in counter allocation problem, T R Lalita, D K Manna and G S R Murthy, Journal of Air Transport Management (85) 2020.
5. An Efficient Algorithm To The Integrated Shift And Task Scheduling Problem, T R Lalita and G S R Murthy, Technical Report (SQCOR-2020-04), under review for publication.
6. T. Parthasarathy's contributions to complementarity problems: a survey, Murthy, G.S.R., Sivakumar, K.C. & Sushmitha, P. Ann Oper Res (2018).
7. A Note on Multivariate Folded Normal Distribution, G S R Murthy, *Sankhya B: The Indian Journal of Statistics*, Volume 77, Issue 1, pp 108-113 (May 2015).
8. On Fully-semimonotone Matrices, G S R Murthy, T. Parthasarathy and R. Sridhar, *International Game Theory Review*, Vol. 15, No.4 (2013), World Scientific Publishing Company.

9. Complementarity Problems And Positive Definite Matrices,
P Bhimasankaram, T Parthasarathy, A L N Murthy and G S R Murthy,
Algorithmic Operations Research Vol.7 (2013) 94-102.
10. Designing Earth Dams Optimally, G S R Murthy, K G Murty and G
Raghupathy, accepted for publication in the Special issue of *IAPQR Trans-*
actions, 40th Anniversary issue, 2013.
11. A Network Flow Model for Irrigation Water Management, A L N Murthy
and G S R Murthy, *Algorithmic Operations Research* Vol.7 (2013) 83-93.
12. Optimization in $2^m 3^n$ Factorial Experiments, G S R Murthy and D K
Manna, *Algorithmic Operations Research* Vol.7 (2013) 71-82.
13. A Phase III Study to Evaluate the Safety and Efficacy of Recombinant
Human Epidermal Growth Factor (REGEN-DTM 150) in Healing Dia-
betic Foot Ulcers, Vijay Viswanathan, Sharad Pendsey, N Sekar, G S R
Murthy, *WOUNDS* 2006; 18(7): 186-196.
14. An Application of Gumbel's Bivariate Exponential Distribution in Esti-
mation of Warranty Cost of Motor Cycles, Surajit Pal and G S R Murthy,
International Journal of Quality and Reliability Management, Vol. 20
No.4 (2003) 488-502.
15. On the connectedness of solution sets of parametrized equations and of so-
lution sets in linear complementarity problems, "by M Seetharama Gowda,
G S R Murthy and T Parthasarathy, *Complementarity: Applications,*
Algorithms and Extensions edited by M. C. Ferris et al. (eds.), Chap-
ter 8, 165-177, ©2001 *Kluwer Academic Publishers*.
16. On the solution sets of linear complementarity problems by G S R Murthy,
T Parthasarathy and B Sriparna, *SIAM J. MATRIX ANAL. APPL.*,
Vol.21, No.4 (2000) 1229-1235.
17. Principal Pivoting Method for Solving Column Sufficient Complementar-
ity Problems by A L N Murthy and G S R Murthy, *SIAM J. MATRIX*
ANAL. APPL., Vol.22, No.2 (2000) 527-532.
18. Linear complementarity problems in static and dynamic games, G S R
Murthy, T Parthasarathy and B Sriparna, in *Advances in dynamic games*
and applications (Kanagawa, 1996), 289-301, Birkhauser Boston, Boston,
MA, 2000; CNO 1770179.

19. A note on Lipschitzian and P_1 -matrices by G S R Murthy, S K Neogy and Frank Thuijsman, *SIAM J. MATRIX ANAL. APPL.*, Vol.21, No.2 (1999) 636-641.
20. Some recent results on the linear complementarity problem, G S R Murthy, T Parthasarathy and B Sriparna, *SIAM J. MATRIX ANAL. APPL.*, Vol.19, No.4 (1998) 898-905.
21. Fully Copositive Matrices, G S R Murthy and T Parthasarathy, *Mathematical Programming* 82 (1998) 401-411.
22. Constructive characterization of Lipschitzian Q_0 -matrices, G S R Murthy, T Parthasarathy and B Sriparna, *Linear Algebra and its Applications* 252:323-337 (1997).
23. A chain condition for Q_0 -matrices, A K Biswas and G S R Murthy, T Parthasarathy et al.(eds.). *Game Theoretical Applications to Economics And Operations Research*, ©Kluwer Academic Publishers (1997) 153-156.
24. Lipschitzian Q -Matrices Are P -Matrices, G S R Murthy, T Parthasarathy and M Sabatini, *Mathematical Programming* 74 (1996) 55-58.
25. Some Properties of Fully Semimonotone, Q_0 -Matrices, G S R Murthy and T Parthasarathy, *SIAM J. MATRIX ANAL. APPL.*, Vol.16, No.4 (October 1995) 1268-1286.
26. On Copositive, Semimonotone Q -Matrices, G S R Murthy, T Parthasarathy and G Ravindran, *Mathematical Programming* 68 (1995) 187-203, North-Holland.
27. A Note on Negative Lipschitzian Matrix, G S R Murthy, T Parthasarathy and M Sabatini, *Opsearch* Vol.31, No.3 (1994) 237-239.
28. A Note on Sufficient conditions for Q_0 and $Q_0 \cap P_0$ -Matrices, G S R Murthy, *Mathematical Programming* 61 (1993) 345-349, North-Holland.
29. A Copositive Q -Matrix which is not R_0 , G S R Murthy, T Parthasarathy and G Ravindran, *Mathematical Programming* 61 (1993) 131-135, North-Holland.

Foreign Visits

- Lehigh University, Bethlehem, USA (2014): Organized technical session in MOPTA (2014).
- University of Michigan, Ann Arbor (2013)
- Georgia Institute of Technology, USA (2013): Collaborative research.
- Emirates Airlines, Dubai (July, 2002) : Consultancy work.
- Emirates Airlines, Dubai (April, 2002) : Consultancy work.
- University of Maryland, Baltimore, USA (2000): Collaborative research.
- University of Illinois, Chicago, USA (2000): Collaborative research visit.
- Ecole Polytechnique University, Laussane, Switzerland (1997): Participated in the International Symposium on Mathematical Programming and presented a paper.
- University of Maastricht, Maastricht, The Netherlands (1997): Collaborative research visit.
- University of Michigan, Ann Arbor, USA (1994): Participated in the International Symposium on Mathematical Programming and presented a paper.
- University of Georgia Tech, Atlanta, USA (1994): Collaborative research visit.
- Worcester Polytechnic Institute, Worcester, USA (1994): Delivered a talk.