Dr. V. Vetrivel
Professor
Department of Mathematics
I.I.T. Madras.

AREA OF RESEARCH: Nonlinear Analysis, Optimization, Monotone Operators

ACADEMIC POSITIONS:

1. Head, Department of Mathematics, IIT Madras, 2020-2023
2. Professor (HAG), Department of Mathematics, IIT Madras, since July 2016
3. Professor, Department of Mathematics, IIT Madras, 2006-2016
4. Associate Professor, Department of Mathematics, IIT Madras, 2000-2006
5. Assistant Professor, Department of Mathematics, IIT Madras, 1998-2000
6. Assistant Professor, Department of Mathematics, IIT Kharagpur, 1995-1998
7. Lecturer, Department of Mathematics, IIT Kharagpur, 1992-1995

MAJOR ADMINISTRATIVE ROLES:

- OBC Liaison officer, IIT Madras, 2005-2013
- Member, grievance committee
- Member, Recruitment committee for Faculty and Non-teaching staff at IIT Madras.
- Faculty Council Member, IITM, Research park, since July 2019
- President, Staff Club, IIT Madras
- Vice-President, Forum for Interdisciplinary Mathematics
- Steering Committee Member, IDDD in Quantitative Finance, 2022

MAJOR ACADEMIC MOUs

Institute Champion for the MOU between IIT Madras and ISI Chennai Chapter.
Institute Champion for the MOU between IIT Madras and University of Obuda, Hungary.

Ph D. STUDENTS SUPERVISED:

1. Kanchan Mittal, Bi-level and Quasi Optimization Problems: Stability and Convergence Analysis, 2024.

2. Kuntal Som, On Set-Valued Optimization Problems: Existence, Well-Posedness and Robustnness, 2021 (Assistant Professor, IIT Jodhpur)

3. Soumitra Dey, Algorithmic approaches to variational inclusions and fixed point problems, 2020 (Postdoctoral Fellow, Technion, Israel).

4. Bhupendra Singh, Some results on Rotation Symmetric Bent Functions and Complementary Symmetric Boolean Functions, 2019. (Scientist, DRDO)

5. Asrifa Sultana, Fixed Points of contractive and multivalued mappings , IIT Madras 2015. (Assistant Professor, IIT Bhilai)

6. M. Panchatcharam, GPU Accelerated Finite Pointset Method for Flow Problems, IIT Madras, 2013 (Associate Professor, IIT Tirupati)

7. I. Jeyaraman, Linear Complementarity Problems over Symmetric cones, IIT Madras, 2011. (Assistant Professor, NIT Trichy)

8. A. Chandrashekaran, Standard and semidefinite linear complementarity problems, IIT Madras 2010 (Assistant Professor, Central University of Tamilnnadu)

9. K. Selvanayagam, Optimal control of film casting processes, IIT Madras, 2009. (Senior Research Scientist, LMS-Siemens Technologies, Chennai)

10. R. Balaji, On Semidefinite Linear Complementarity Problems , IIT Madras, 2005 (Professor, IIT Madras)

11. S. Mohan Kumar, Modeling and Simulations of Incompressible Flow Through Porous Obstracles in a Closed and Open Channel, IIT Madras, 2005 (Vice President, Research, BNY Mellon, Pune)

12. Joydeep Dutta, Optimality and Duality for Inequality Constrained and Cone Constrained Programs, IIT Kharagpur, 1998. (Professor, Dept of Economics, IIT Kanpur)

13. Sugato Gangopadhyay, On Units of Group Rings, IIT Kharagpur, 1998. (Professor, Dept. of Computer Science, IIT Roorkee)

POST DOCTORATE FELLOW

1. Pankaj Gautam, IIT Madras, 2022. (Assistant professor, Dept. of Applied Mathematics & Scientific Computing, IIT Roorkee)

RESEARCH PUBLICATIONS:

1. Forward-Backward-Forward method for Bilevel Equilibrium ProblemK Mittal, P Gautam and V Vetrivel, *Annals of Operations Research,* 2024.

2. Finite convergence and sharp minima for quasi-equilibrium problems, K Mittal, P Gautam and V Vetrivel, *Journal of Optimization Theory and Applications,* 2024.

3. Results on existence of l-minimal and u-minimal solutions in set-valued optimization, K Som and V Vetrivel, to appear in Convex Optimization : Theory, Algorithms and Applications, Springer Nature, 2024.

4. Well-posedness for the split equilibrium problem, Soumitra Dey, V. Vetrivel and Hong-Kun Xu, *Optimization Letters*, 18, p. 977-989, 2023.

5. Parameterized Douglas-Rachford dynamical system for monotone inclusion problems, P. Gautam, K. Som, V. Vetrivel, *Applied set-valued analysis and optimization*, 5 (1), 19-29, 2023

6. Global well-posedness of set-valued optimization with application to uncertain problems, K Som and V Vetrivel, *Journal of Global Optimization*, 88 (8), p.511-539, 2022.

7. A note on pointwise well-posedness of set-valued optimization problems, K Som and V Vetrivel, *Journal of Optimization Theory and Applications*, 192, p.628-647, 2022.

8. Pointwise well-posedness of a set-valued optimization problem at a weak solution, K Som and V Vetrivel, *The Journal of Analysis*, **31**, p.187–199, 2023.

9. On robustness for set-valued optimization problems, K Som and V Vetrivel, *Journal of Global Optimization* 79, 905–925, 2021.

10. Notes on the neural network approach to inverse variational inequalities, Hong-Kun Xu, Soumitra Dey, and V Vetrivel, *Optimization*, 70, No. 5-6, 901-910, 2021.

11. A neural network method for monotone variational inclusions, Soumitra Dey, V Vetrivel, and Hong-Kun Xu*, J. Nonlinear Convex Anal.*, 20, No. 11, 2387-2395, 2019.

12. On Approximate solution to Inverse Quasi-Variational Inequality Problem, S Dey and V Vetrivel, *Sci. Math. Japonica*, 81, No. 3, 301-306, 2019.

13. On Nonexistence of bent – negabent rotation symmetric Boolean functions, B. Mandal, B. Singh, S. Gangopadhyay, S. Maitra and V. Vetrivel, *Discrete Appl. Math.* Vol. 236, p. 1-6, 2018.

14. Best Proximity Points of Contractive Mappings on a Metric Space with a Graph and Applications, A. Sultana and V. Vetrivel, *Applied General Topology,* Vol.18, p.13-21, 2017.

15. An Extension of Set-Valued Contraction Principle for Mappings on a Metric Space with a Graph and Application*, Numerical Functional Analysis and Optimization*, 38, p. 1060-1068, 2017.

16. On the existence of projected solutions of quasi-variational inequalities and generalized Nash equilibrium problem, D. Aussel, Asrifa Sultana and V. Vetrivel, *Journal of Optimization Theory and Applications* 170, 818-837, 2016.

17. Fixed Points for Contractive Mappings on a Metric Space with a Graph: A survey, Asrifa Sultana, V Vetrivel, *Journal of Orissa Mathematical Society,* 35, 111-127, 2016.

18. On the existence of best proximity points for generalized contractions, Asrifa Sultana and V Vetrivel, *Applied General Topology*, Vol. 15, p. 55-63, 2014.

19. Investigations on cubic rotation symmetric bent functions , S.Gangopadhyay, B. Singh and V.Vetrivel, *Electronic Notes in Discrete Mathematics* 56, 15- 19, 2016.

20. GPU computing for meshfree particle method. M.Panchatcharam, Axel Klar, S.Tiwari, S.Sundar and V.Vetrivel, *International Journal of Numerical Analysis and Modelling*, Series B. 4, p.394-412, 2013.

21. Fixed points of Mizoguchi-Takahashi contraction on a metric space with a graph and applications, A. Sultana and V. Vetrivel, *Journal of Mathematical Analysis and Applications,* Vol.417, p. 336-344, 2014.

22. Solving Strongly Monotone Linear Complementarity Problem, A. Chandrashekaran, T.Parthasarathy and V.Vetrivel, *International Game Theory Review,* Vol.15, No.4, 2013.

23. Stein Linear Programs over Symmetric Cones, I.Jeyaraman, K.C. Sivakumar and V.Vetrivel, *International Game Theory Review*, Vol.15, No.4, 2013.

24. On the Lipschitzian Property in Linear Complementarity Problems over symmetric cones, I.Jeyaraman and V.Vetrivel, *Linear Algebra Appl.*, Vol.435, p. 842-851, 2011.

25. Fuzzy inference system based contrast enhancement, B Jayaram, K Narayana and V Vetrivel, 7^{Th} conference of the European Society for Fuzzy Logic and Technology, EUSFLAT 2011, Aix-les-Bains, France, July 18-22, 2011.

26. Jordan Quadratic SSM _Property and its relation to copositive linear transformations on Euclidean Jordan Algebras, I.Jeyaraman and V.Vetrivel, *Linear Algebra Appl*. Vol. 433, p. 390-400, 2010.

27. On the $P_{2'}$ and P_2 Properties in the semidefinite linear complementarity problem, A. Chandrashekaran, T.Parthasarathy, and V.Vetrivel, *Linear Algebra Appl*. 432, 134-143, 2010.

28. Optimal control of film casting processes, K.Selvanayagam, Thomas Goetz, S.Sundar and V.Vetrivel, *Int. J. Numerical Methods in Fluids,* Vol.59, p.1111-1124, 2009.

29. Optimal die shape for film casting, K.Selvanayagam, Thomas Goetz, S.Sundar and V.Vetrivel, *Applied Mathematics Letters*. Vol.22, p.1598-1603, 2009.

30. Global well-posedness of set-valued optimization with application to uncertain problems Soumitra Dey, V Vetrivel, and Hong-Kun Xu, Journal of Global Optimization.

31. On the Lipschitz Continuity of the Solution Map in Semidefinite Linear Complementarity Problems, R. Balaji, T. Parthasarathy, D.S. Raman and V. Vetrivel, *Mathematics of Operations Research*, Vol.30, No. 2, p. 462-471, 2005.

32. On the Lipschitzian GUS – Property of Linear Maps in in Semidefinite Linear Complementarity Problems, R. Balaji, T.Parthasarathy and V.Vetrivel, in "*Operations Research with Economic and Industrial Applications: Emerging Trends*" Eds. S.R.Mohan and S.K.Neogy, Anamaya Publishers, NewDelhi, Chapter 13, p.181-187, 2005.

33. Navier Stokes-Brinkmann model for incompressible flow over a porous layer, S.Mohan Kumar, S.Sundar and V.Vetrivel, *Proceedings of the International Workshop on Modeling and Simulation. Narosa*, pp.283-293, Narosa, 2005.

34. On Approximate Minima in Vector Optimization, J. Dutta and V.Vetrivel, *Numerical Functional Analysis and Optimization*, Vol.22, p. 845-859, 2002.

35. Mathematical Programming with a class of Non-Smooth Functions, J.Dutta and V.Vetrivel, *Journal of Systems Science and Complexity*, Vol.15, No.1, p. 52-60, 2002.

36. Motzkin Type Alternative Theorem and Set-Valued Optimization, V.Vetrivel and J.Dutta, *The Journal of Analysis*, 9, p. 137-147, 2001.

37. A Remark on Gwinner's Existence Theorem on Variational Inequality Problem, V.Vetrivel and S.Nanda, *International Journal of Mathematics and Mathematical Sciences*, 24, No.8, p.573-575, 2000.

38. Necessary Optimality Conditions with Non-smooth Invex Functions, V.Vetrivel, and J.Dutta, in *Non-Smooth/Non-Convex Mechanics: Modeling, Analysis and Numerical Methods*, Eds. D.Y. Gao, R.W. Ogden and G.E. Stavroulakis, Kluwer Academic Publishers, Boston, London, Chapter 20, p. 427-446, 2000.

39. On Saddle Points and Optima for Non-smooth and Non-convex Programs, J.Dutta and V.Vetrivel and S.Nanda, *Optimization*, 42, p. 71-83, 1997.

40. On Units in ZS_3, R.K.Sharma, S.Gangopadhyay and V.Vetrivel, *Communications in Algebra*, 25, p. 2285-2299, 1997.

41. Semi-Invex Functions and Their Subdifferentials, J.Dutta, V.Vetrivel and S.Nanda, *Bulletin of Australian Mathematical Society*, 56, p.385-393, 1997.

42. Fixed Point Theorems for Multifunctions, P. Bhattacharyya and V.Vetrivel, *Journal of Mathematical and Physical Sciences* 30, p.187-192, 1996.

43. Existence of Ky Fan's Best Approximation for Set valued Maps, V.Vetrivel, *Indian Journal of Pure and Applied Mathematics*, 27,p.173-175, 1996.

44. Common Fixed Point Theorems, S. Basha and V. Vetrivel, *Acta Scientiarum Mathematicarum (szeged)*, 62, 279-288, 1996.

45. Applications of Lassonde's Fixed Point Theorem, P.Bhattacharyya and V.Vetrivel, *Journal of Mathematical and Physical Sciences*, 29, p.19-31, 1995.

46. An Existence Theorem on Generalized Quasi-Variational Inequality Problem, P. Bhattacharyya and V. Vetrivel, *Journal of Mathematical Analysis and Applications*, 188, p. 610-615, 1994.

47. Some Extensions of Fan's Best Approximation Theorem, V.Vetrivel, P.Veeramani and P.Bhattacharyya, *Numerical Functional Analysis and Optimization*, 13, p.397-402, 1992.

48. On Some Fixed Point Theorems for Nonexpansive Mappings, V.Vetrivel, P. Veeramani and P. Bhattacharyya, *Journal of Mathematical and Physical Sciences*, 26, p. 165-174, 1992.

SPONSORED PROJECTS:

- FIST Project, Rs. 1,60,00,000, DST-SERB, 2023-2026
- TARE Project, Rs. 10,50,000, DST SERB, 2022-2025
- FIST-DST Meet, Rs.5,00,000 during 2022.
- MATRICS Project under DST, during 2018-2021.
- Research Scholars Meet, DST-SERB, Rs.5,97,000 during 2010.
- Non-smooth Calculus and Proximal Bundle Methods, sponsored by DST-SERB, -Rs. 5,03,000 during 2002-2005.
- "Optimization with set functions", IIT Madras (New faculty Scheme, 1999. Rs.1,00,000 during 1999.

NATIONAL LEVEL IMPORTANT ROLES

- Mathematics Course Coordinator, IIT PAL, 2017

- Member of SERB Expert Committee for Physical and Mathematical Sciences, Dept. of Sci. & Tech., New Delhi, since 2018 for NPDF, SRG and MATRICS schemes and DST-FIST since 2024.

- External Senate Member, IIT Palakkad for the year 2024-2025

REVIEWER FOR JOURNALS

- AMS Mathematical Review.
- Proceedings of American Mathematical Society
- Indian Journal of Pure and Applied Mathematics
- Bulletin of Calcutta Mathematical Society.
- Journal of Analysis.
- Applied Mathematics Letters
- Computers and Mathematics with Applications.
- Journal of Optimization Theory and Applications
- Linear Algebra and Applications
- Bull. Calcutta Mathematical Society

WORKSHOPS ORGANIZED

1. National Symposium on Mathematical Methods and Applications (NSMMA 2012) at IIT Madras on 22nd December, 2012.

2. National Meet of Research Scholars in Mathematical Sciences, sponsored by Dept. of Sci. & Tech., India, 11-15, October, 2010, IIT Madras.

3. National Symposium on Mathematical Methods and Applications (NSMMA 2006) at IIT Madras on 22nd December, 2006

4. Coordinator, Refresher Course on Optimization: Algorithms and Applications sponsored by University Grants Commission, India, during 11-21 December, 2002 at IIT Madras.

5. Convener, Local Organizing Committee, Third International Conference on Operations Research and Game Theory with Economic and Industrial Applications, held at IIT Madras, 3-7 Jan, 2000.

6. Coordinator, Mathematical Olympiad Problems Co-ordinators' Camp at I.I.T. Kharagpur, in 1996.

PROFESSIONAL VISITS:

- Visiting Assistant Professor, University of Washington, Seattle, USA, 2000
- Visiting Fellow, International Centre for Theoretical Physics (ICTP), Trieste, Italy, March 2004.
- Guest speaker at the workshop held in University of Kwazulu, Pietermaritzberg, South Africa, October, 2010.
- Visiting Fellow, University of Koblenz, Germany, 2018
- Visiting Fellow, University of Hangzhou, China 2018.

PERSONAL

Born: 26, March 1964

Married.