ANNUAL REPORT – 2011-12

1. Books and Book Chapters Published

1. A. Dhara and **J. Dutta,** Optimality conditions in convex optimization. A finite-dimensional view. *CRC Press, Taylor and Francis, Boca Raton, FL,* 2011,

2. J. Dutta and KKT Strong, Second Order Conditions and Nonsolid Cones in Vector Optimization, published as Chapter 5 in Recent Developments in Vector Optimization, Q. H. Ansari and J. C. Yao, Eds. Springer 2011,

2. Research Papers published in Journal

1. R. Dalmeya, I. Sharma, C. S. Upadhyay and **A. Anand**. Contact of a rigid cylindrical punch with an adhesive elastic layer, Journal of Adhesion, 88 (1), 1-31, 2012,

2. I. Mishra, **D. Bahuguna** and S. Abbas Existence of almost automorphic solutions of neutral functional differential equation, Nonlinear Dyn. Syst. Theory 11, no. 2, 165–172,. 2011.

3. D. Bahuguna and J. Dabas, Existence and uniqueness of solutions of strongly damped wave equations with integral boundary conditions, Nonlinear Dyn. Syst. Theory 11 no. 1, 65–82, 2011

4. R. Haloi, **D. Bahuguna**, D. N. Pandey, Existence and Uniqueness of Solutions for Quasi-Linear Differential Equations with Deviating Arguments, Electronic Journal of Differential Equations, Vol. 2012 No. 13, pp. 1–10, 2012

5. M. Banerjee, Spatial pattern formation in ratio-dependent model: higher order stability analysis, Math. Med. Biol. IMA Jr., **28**, 111 - 128, 2011

6. S. Abbas**,M. Banerjee** and S. Momani.Dynamical analysis of a fractional-order modified logistic model, Comp. Math. Appl., **62**, 1098 - 1104, 2011,

7. M. Banerjee and E. Venturino.A phytoplankton - toxic-phytoplankton – zooplankton model, Ecol. Compl., **8**, 239 - 248, 2011,

8. R. K. Upadhyay, **M. Banerjee**, R.D. Parshad and S. N. Raw.Deterministic chaos versus stochastic oscillation in a prey-predator-top predator model, Math. Model. Anal., **16**, 343 - 364, 2011,

9. S. Abbas, M. Sen and **M. Banerjee**.Almost periodic solution of a non-autonomous model of phytoplankton allelopathy,Nonlin. Dyn., **67**, 203 - 214, 2012,

10. P. S. Mandal and **M. Banerjee**.,Stochastic persistence and stationary distribution in a Holling-Tanner type preypredator model, Physica A, **391**, 1216 - 1233, 2012,

11. A. Morozov, M.Sen and **M. Banerjee,**Top-down control in a patchy environment: revisiting the stabilizing role of fooddependent predator dispersal, Theor. Pop. Biol., **81**, 9 - 19, 2012,

12. P. J. Pal, T. Saha, M. Sen and **M. Banerjee,** A delayed predator-prey model with strong Allee effect in prey population growth, Nonlin. Dyna., **68**, 23 - 42, 2012,

13. M. Banerjee and S. Banerjee,Turing instabilities and spatio-temporal chaos in ratio-dependent Holling-Tanner model, Math. Biosci., **236**, 64 - 74, 2012,

14. S. Banerjee and **M. Banerjee,**Noise induced oscillations in time delayed semiconductor laser system, Opt. Comm, **285**, 2402 - 2409, 2012,

15. R. P. Gupta, **M. Banerjee** and **Peeyush Chandra**.The dynamics of two-species allelopathic competition with optimal harvesting, *Journal Biological Dynamics*, Vol. 6, No. 2, March, 674–694, 2012

16. M.A. Khan and **Mohua Banerjee** ,Logics for information systems and their dynamic extensions, *ACM Transactions on Computational Logic*, 12 (4), art. no. 29, 2011,.

17. M.A. Khan and **Mohua Banerjee,** A logic for multiple-source approximation systems with distributed knowledge base. *Journal of Philosophical Logic*, 40 (5), 663-692, 2011,

18. A.K. Misra, **Peeyush Chandra** and **V. Raghavendra**.Modeling the depletion of dissolved oxygen in a lake due to algal bloom: Effect of time delay – *Advances in Water Research*, Volume 34, Issue 10, Pages 1232-1238, 2011,

19. S. L. Chavan.Essential Normality of Operators Close to Isometries, Integral Equations and Operator Theory, 73 49-55, 2012,

20. A. Dar,Examples of amphicheiral knots of braid index 3, Proceedings of the National Academy of Sciences, India, Vol. 81, Section A, Part 3 (July-September), 221-222, 2011,

21. S. Dempe and **J. Dutta**.Is bilevel programming a special case of a mathematical program with complementarity constraints?, *Mathematical Programming, Series A,* Vol 131, No 1.-2, 37-48, 2012

22. J. Dutta and K. C. Yalçın.A new scalarization and numerical method for constructing the weak Pareto front of multi-objective optimization problems, *Optimization*, 60 no. 8-9, 1091– 1104, 2011.

23. M. Durea, **J. Dutta** and Chr Tammer.Stability properties of *KKT* points in vector optimization, *Optimization*, 60 no. 7, 823–838, *Optimization*, 2011

24. D. Aussel and **J. Dutta**.On gap functions for multivalued Stampacchia variational inequalities, *J. Optim. Theory Appl.* 149 no. 3, 513–527, 2011

25. S. Dutta and **P. Shunmugaraj,** Modulus of strong proximinality and continuity of metric projections, Set valued and Variational Analysis, 19 no. 2, 271–281, 2011

26. M. Gupta and L.R. Acharya.Approximation numbers of matrix transformations and inclusion maps, Tamkang Journal Of Mathematics, 42 (2), 193-203, 2011

27. M. K. Kadalbajoo, L. Tripathi and A. Kumar. A cubic B-spline collocation method for a numerical solution of the generalized Black–Scholes equation, Mathematical and Computer Modelling, Volume 55, Issues 3–4, 1483-1505, 2012

28. M. K. Kadalbajoo and A. Jha.Analysis of fitted spline in compression for convection diffusion problems with two small parameters, Neural, Parallel, and Scientific Computations, Volume 89, Issue 6, 307-322, 2012

29. M. K. Kadalbajoo and A. Jha.Exponentially fitted cubic spline for two-parameter singularly perturbed boundary value problems, International Journal of Computer Mathematics, 19, 836-850, 2011

30. M. K. Kadalbajoo and A. Gupta, An Overview on the Eigenvalue Computation for Matrices, Neural, Parallel & Scientific Computations, Volume 19, No. 1 & 2, 129-164, 2011.

31. D. Kundu.Statistical Signal Processing, International Encyclopedia of Statistical Science, Springer, New York, Part 19, 1466 - 1468, 2011,

32. B. Pradhan and **D. Kundu**.Bayes estimation and prediction of the two-parameter gamma distribution, Journal of Statistical Computation and Simulation, vol. 81, no. 9, 1187 - 1198, 2011,

33. A. K. Dey and **D. Kundu**.Discriminating between the Weibull and Log-normal distributions for type-II censored data, Statistics, vol. 46, no. 2, 197 - 214, 2012,

34. D.K. Al-Mutairi, M.E. Ghitany and **D. Kundu**.A new bivariate distribution with weighted exponential marginals and its multivariate generalization, Statistical Papers, vol. 52, 921-936, 2011,

35. N. Balakrishnan, R.C. Gupta, **D. Kundu**, V. Leiva and A. Sanhueza.On some mixture models based on the Birnbaum - Saunders distribution and associated inference, Journal of Statistical Planning and Inference, vol. 141, 2175 -2190, 2011,

36. D. Kundu and R.D. Gupta Absolute continuous bivariate generalized exponential distribution, Advances in *Statistical Analysis, vol. 95, 169 - 185, 2011,.

37. B. Sarcoglu, I. Kinaci and **D. Kundu** On estimation of R = P(Y < X) for exponential distribution under progressive type-II censoring, Journal of Statistical Computation and Simulation, vol. 82, no. 5, 729 -744, 2012,.

38. D. Kundu, Z. D. Bai, S. Nandi and L. Bai.Super efficient frequency estimation, Journal of Statistical Planning and Inference, vol. 141, 2576 - 2588, 2011,

39. R.C. Gupta and **D. Kundu,** Weighted Inverse Gaussian - a Versatile Lifetime Model, Journal of Applied Statistics, vol. 38, 2695 - 2708, 2011,

40. D. Kundu and R.D. Gupta.An extension of the generalized exponential distribution, Statistical Methodology, vol. 8, 485 - 496, 2011,

41. D. Kundu and M.Z. Raqab.Bayesian inference and prediction of order statistics for Type-II censored Weibull distribution, Journal of Statistical Planning and Inference, vol. 142, 41-47, 2012,

42. M. Franco,**D. Kundu** and J-M Vivo Multivariate extension of modified Sarhan - Balakrishnan bivariate distribution, Journal of Statistical Planning and Inference, vol. 141, 3400 - 3412, 2011
.

43. A.Ganguly, **S. Mitra**, D. Samanta and **D. Kundu**.Exact inference for the two-parameter exponential distribution under Type-II hybrid censoring, Journal of Statistical Planning and Inference, vol. 142, 613 - 625, 2012,

44. A. Lahiri, **D. Kundu** and **A. Mitra ,**Efficient algorithm for estimating the parameters of chirp signal, Journal of Multivariate Analysis, vol. 108, 15-27, 2012,

45. A. K. Dey and **D. Kundu**.Discriminating between bivariate generalized exponential and bivariate Weibull distributions, Chilean Journal of Statistics, vol. 3, no. 1, 93 - 110, 2012,

46. A. K. Lal, K. L. Patra, B. K. Sahoo. Algebraic connectivity of connected graphs with fixed number of pendant vertices.Graphs, Combin., 27, no. 2, 215-229, 2011

47. A. K. Lal, S. Mohanty and **N. Nilakantan**.Combinatorial PDEs on Cayley and coset graphs, Discrete Mathematics, 311, 22, pp.2587-2592,

48. N. Misra and A.K. Misra., A note on active redundancy allocations in *k*-out-of-*n* systems, *Statist. Probab. Lett.*81 no. 10, 1518–1523, 2011

49. N. Misra, A.K. Misra and **I.D. Dhariyal**.Active redundancy allocations in series systems, *Probab. Engrg. Inform. Sci.* 25, no. 2, 219–235, 2011

50. S. Mitra, **A. Mitra** and **D. Kundu**.Genetic Algorithm and M-estimator based robust sequential estimation of parameters of nonlinear sinusoidal signals, Communications in Nonlinear Sciences and Numerical Simulations, Vol.16, Issue 7, 2796-2809, 2011

51. S. Mitra, V.Maheswari and **A. Mitra,**A wavelet filtering based estimation of output gap, Applied Mathematics and Computations, Vol. 218, Issue 7, 3710-3722, 2011

52. S. Mitra and **A. Mitra**., A genetic algorithms based technique for computing non-linear least squares estimates of parameters of sum of exponential model, Expert Systems with Applications, Vol. 39, Issue 7, 6370-6379, 2012

53. S. Mitra and Erum.Early warning prediction system for high inflation: an elitist neuro-genetic network model for the Indian economy, Neural Computing and Applications, March 2012,

54. P. Mohanty and S. Shrivastava.Bilinear Littlewood - Paley for circle and transference. Publ. Mat. 55 , no. 2,501–519, 2011

55. P. Mohanty and S. Shrivastava.Vector valued bilinear maximal operator and method of rotations, J. Math. Anal.Appl. 382, no. 1, 334–338, 2011

56. R. Mahadevan and **T. Muthukumar**.Homogenization of Some Cheap Control Problems, SIAM Journal on Mathematical Analysis, Vol. 43, No.5, 2211-2229, 2011

57. S. Kesavan and **T. Muthukumar**.Homogenization of an Optimal Control Problem with State-constraints, Differential Equations and Dynamical Systems, Vol. 19, No.4, 361-374, 2011

58. N. Nilakantan and **V. Raghavendra**.Global Stability given Local Stability via Curvature of Some Nonautonomous Differential Equations, Non Linear Dynamics and Systems Theory, Vol 12, No.1, 105-109, 2012

59. R. Santhanam.The units of equivariant ring spectra, Algebraic and Geometric Topology, Vol.11, no. 3, 1361-1403, 2011

60. C. Chu, O. Lorchield and **R. Santhanam**.Sheaves and K-theory for F_1 schemes, Advances in Mathematics, Vol. 229, Issue 4, 2239-2286,2012

61. S. K. Ray and R. P. Sarkar, Note on a Result of Kerman and Weit, Journal of Fourier Analysis and Applications, published online, 2011,

62. Shalabh, H. Toutenburg and A. Fieger Using Diagnostic Measures to Detect Non-MCAR Processes in Linear Regression Models With Missing Covariates" Journal of Statistical Research, Vol. 44, No. 2, pp.233-242 (Invited paper in honor of Professor Bradley Efron), 2010, apppeared 2011

63. Shalabh, G. Garg and **N. Misra** ,Estimation of Regression Coefficients in a Restricted Measurement Error Model using Instrumental Variables, Communications in Statistics (Theory & Methods), Vol. 40, pp.3614-3629, 2011,.

64. Shalabh and C. Heumann, Simultaneous Prediction of Actual and Average Values of Study variable Using Stein-rule Estimators" in Some Recent Developments in Statistical Theory and Application, (Eds. K. Kumar and A. Chaturvedi), pp. 68-81, Brown Walker Press, U.S.A., 2012,

65. S.Kulathinal, **Shalabh** and B. Joseph.,Analysis of Pooled Time Series and Spatial Data with an Application to Water Level Data", Journal of Applied Statistical Science, Vol. 18, No. 3, pp.419-430, 2012,

3. Research papers published in conference proceedings (as a full paper)

1. C. Turc, **A. Anand**, O. Bruno and J. Chaubell, Efficient solution of three-dimensional problems of acoustic and electromagnetic scattering by open surfaces, Proceedings of the 10th International Conference on Mathematical and Numerical Aspects of Waves, Vancouver, Canada, 655-657, 2011

2. S. P. Chakraborty and **M. Banerjee**.Periodic optimal efficacy in a combination treatment of HIV, Proceedings of the Second International Conference on Advances in Control and Optimization of Dynamical Systems, 2012,

3. M.A. Khan and **M. Banerjee,** Information systems and rough set approximations: an algebraic approach. In Lecture Notes in Computer Science 6744, Proc. 4th Int. Conf. on Pattern Recognition and Machine Intelligence (PReMI '11), Moscow, Russia, Eds. Kuznetsov, S.O. et al. (Springer-Verlag), 744-749, June 2011

4. M.V. Radhika, **Peeyush Chandra,** P.K. Srivastava Mathematical Modeling of opiate drug users - Proceeding of International Conference on Mathematical Modelling and Applications to Industrial Problems, NIT Calicut, Page: 467-473 (ISBN-789350590249), . (MMIP2011)

4. Seminars and invited talks presented

1. D. Bahuguna, Theory and Methods for Partial Differential Equations, 5 lectures at SSSIHL, February 16-18, 2012, Prashanthinilayam,

2. M. Banerjee Global Dynamics for Prey-Predator Model with Allee Effect, National Conference on Recent Advances in Mathematics, 2012, 02 - 04 Feb. 2012, Lucknow University

3. **M Banerjee,** Spatio-temporal pattern formation in ecology - modern perspective, National Meet of Research Scholars in Mathematical Sciences – 2011,12 – 15 October, 2011, IIT Kharagpur

4. M. Banerjee.,Cold spot, hot spot, labyrinthine and chaotic pattern in a Holling -Tanner prey-predator model, Mathematical and Theoretical Ecology, 2011 (MATE-2011), , 19 - 21 Sept., 2011, University of Essex, Colchester, UK

5. M. Banerjee. Deterministic vs. Stochastic Dynamics in an Interacting Population Model', in International Conference on Mathematical Biology, India, 04 - 07 July, 2011, held at I.I.Sc. Bangalore,

6. M. Banerjee.Deterministic chaos vs. stochastic oscillation in an eco-epidemic model, 8th European Conference on Mathematical and Theoretical Biology, at Uniwersytet Jagiellonski, Krakow, 28 June - 02 July, 2011, Poland,

7. M. Banerjee Deterministic chaos and stochastic fluctuation in an epidemic model, Department of Mathematics, Bengal Engineering and Science University, May, 2011, West Bengal
.
8. Mohua Banerjee ,Reasoning with multiple-source systems, International Workshop on *Fuzzy Sets, Rough Sets, Uncertainty Analysis and Applications*, November, 2011, NIT Durgapur,
.
9. Mohua Banerjee.,*On Gödel,* Seminar in the Dept. of HSS, October, 2011, IIT Kanpur.

10. Mohua Banerjee.Indiscernibility: a categorical study, Annual Workshop of the Calcutta Logic Circle (CLC), IBRAD, September 2011, Kolkata

11. S. L. Chavan Lectures on Linear Dynamics, 4-8 April, 2012, I.I.Sc. Bangalore,

12. S. Dutta.,Lectures on operator algebras to graduate students, Workshop in Functional Analysis, CUSAT, (jointly organized by I. M. Sc.), December 5 - 12, 2011, Kochi

13. S. Ghorai.,Penetrative bioconvection in a suspension of isotropically scattering phototactic algae Organization, National conference on Mathematical Modelling and Computer Simulation and a Symposium on Understanding Nature and Society, 30June to 2 July, 2011, BGI Kanpur,

14. M. Gupta.,Lectures on advanced topics in Functional Analysis, Department of Mathematics, Kashmir University, Srinagar, May 2011, Kashmir

15. D. Kundu On multivariate proportional hazard model, at I.S.I. Mar. 2012, Kolkata .

16. A. K. Lal.,On problems related to algebraic connectivity of Graphs Organization, Concordia April 01, 2011, University, Montreal, Canada,

17. N. Misra. Optimal redundancy allocations in systems and comparison of component and system level redundancies, at New Developments in theory and Applications of Statistics: An international conference in honor of Professor Moti Lal Tiku, Department of Statistics, Middle East Technical University, Ankara, May 2-4, 2011, Turkey

18. N. Misra ,Estimation of Entropy of Multivariate Distributions, at National Conference on Advances and Applications in Statistics, Department of Statistics, Panjab University, February 20-21, 2012, Chandigarh.

19. N. Misra.,Estimation of Entropy of Multivariate Distributions, XXXI Annual Convention of Indian Society for Probability & Statistics (ISPS) and International Conference on Statistics, at Department of Statistics, University of Science and Technology, December 19-22, 2011, Cochin

20. N. Misra.,Comparison of Reversed Hazard Rates of Two Parallel Systems Comprising of Independent Gamma Components, Workshop on Reliability Theory and Survival Analysis, at Indian Statistical Institute, November 23-25, 2011, Kolkata

21. N.Misra, Optimal redundancy allocations in systems and comparison of component and system level redundancies, Department of Statistics, July 15, 2011 University of Calicut,,

22. N. Misra.Stochastic Comparisons of Poisson and Binomial Distributions with their Mixtures, Department of Mathematics, Indian Institute of Technology, June 3, 2011,

Kharagpur

23. P.Mohanty.Completely bounded L^p multipliers, ICHA, Tianjin, May, 2011, China

24. P. Mohanty.Vector valued Maximal bilinear operator, Sept 2011, Armenia

25. P. Mohanty ,Origin and development of Fourier Series, Hindu College, Delhi,.

26. R. Santhanam, K-theory of F_1 schemes, June 2011, University of Bergen,

27. S. K. Ray.Fourier restriction theorem on Riemannian symmetric spaces of noncompact type,School of Mathematics, TIFR, Mumbai,

28. Shalabh.Talks on Regression Modelling, Forecasting, Model Selection, Goodness of Fit and Measurement Errors, Department of Economics, University of Hyderabad, 2011, Hyderabad,

5. Other Activities

(A) Industry visited and visits to other institutes for research

(i) A. K. Lal., Concordia University, Montreal, Canada, Sep 2010 - May 2011,

(ii) R. Santhanam ,University of Bergen, June 2011**,**

(ii) Shalabh,Institute of Statistics, Ludwig Maximillians University, Munich, Germany, 2011,

(B) Continuing Education Activities

(i) Mohua Banerjee ,Lecture series on *Modal logic and algebra*, 4th Indian School on *Logic and itsApplications* (ISLA), Manipal University, January 2012,.

(ii) T.Muthukumar,Lectures on Multivariable Calculus at MTTS programme, ICT Mumbai, June 2011,

(i) Any other important activity not specified above

(i) Conference Programme Committee Membership, 4th Indian School on Logic and its Applications (ISLA), 2012, Manipal University, **Mohua Banerjee.**

(ii) Conference Programme Committee Membership, Rough Sets and Knowledge Technology (RSKT) 2011, Banff, Canada, **Mohua Banerjee.**

(iii) Conference Programme Committee Membership, Rough Sets, Fuzzy Sets, Data Mining & Granular Computing (RSFDGrC) 2011, Moscow, Russia, **Mohua Banerjee**.

(iv) Invited to the Editorial Board of 'Differential Equations and Dynamical Systems' (a Springer Journal), **Peeyush Chandra**.

(vi) Invited to the Editorial Board of 'Proc. National Academy of Science, India; Sec - A' (a)Springer Journal), **Peeyush Chandra**.

(vi) Invited to the Advisory Committee of 'Interdisciplinary Journal of Mathematical Sciences', **Peeyush Chandra**.

(vii) Delivered lectures in the Basic Training UG Program in Mathematics, IIT Patna, May 10 – 20, 2011, **Peeyush Chandra**.

(viii) Invited talk in the INSPIRE programme at Srinagar (J & K) on Feb 28, 2012, **Peeyush Chandra**.
(ix) Invited talk at Dept. of Applied mathematics, AMU Aligarh on 'Why Mathematics for Engineers' March 28, 2012, **Peeyush Chandra**.

(x) Editorial Board Membership, Journal of Modern Applied Statistical Methods, **D. Kundu**.

(xi) Editorial Board Membership, Statistics and its Applications, **D. Kundu**.

(xii) Editorial Board Membership, Communications in Statistics - Theory and Methods, **D.Kundu**.

(xiii) Editorial Board Membership, Communications in Statistics - Simulation and Computation, **D. Kundu.**

(xiv) Editorial Board Membership, Statistical Theory and Practice, **D. Kundu**.

(xv) Advisory Committee Membership of UGC-DRS-SAP, Dept. of Mathematics, Kalyani University, **M. Gupta**.

(xvi) Editorial Board Membership, Proceedings of the National academy of Sciences, India, (Section A – Physical Sciences), **M. Gupta**.

(xv) A two-week workshop on Euclidean Harmonic Analysis organized at I.I.T. Kanpur, January 2011, **S. Madan** and **P. Mohanty.**