Dr. Chandal Nahak, Ph.D.

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Gulehi
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Date of Birth: 1st July 1966

**Education:**

- Ph.D Indian Institute of Technology Kharagpur on Duality in Control, Variational and Mathematical Programming Problems with Generalized Invexity
- M.Phil Utkal University in Mathematics: Locally Univalent Functions with locally Univalent derivatives
- M. Sc. Utkal University in Mathematics

**Professional Experience:**

- Professor, Dept of Mathematics, IIT Kharagpur (From March 15, 2018 to date)
- Associate Professor, Dept of Mathematics, IIT Kharagpur (From May 4, 2010 to March 14, 2018)
- Assistant Professor, Dept of Mathematics, IIT Kharagpur (From Dec 31, 2003 to May 3, 2010)
- Assistant Professor, Dept of Mathematics, NIT Rourkela (From June 2002 to December 2003)
- Assistant Professor, National Institue of Science and Technology, Berhampur, Orissa (From September 1996 to June 2002)
- Visiting Professor in the Department of Mathematics & Statistics Old Dominion University, Virginia, USA under BOYSCAST fellowship for post doctoral research (funded by DST, Government of India)(From April 1998 to July 1999) .

*From May 04, 2010 to present*
Working as an Associate Professor, Department of Mathematics, Indian Institute of Technology, Kharagpur. Conducting research on Applied Functional Analysis and Optimization, Numerical Optimization, Fractional Calculus, Algebra.
*From Dec 2003 to May 03, 2010*
Working as an Assistant Professor, Department of Mathematics, Indian Institute of Technology, Kharagpur. Teaching various courses in Mathematics to UG and PG students. Conducting research on Applied Functional Analysis and Optimization, Numerical Optimization, Fuzzy Set Theory, Fractional Calculus.
*From June 2002 Dec 2003*
Working as an Assistant Professor, Department of Mathematics at NIT, Rourkela. Teaching various courses in Mathematics to UG and PG students. Conducting research on Applied Functional Analysis and Optimization, Numerical Optimization, Fuzzy Set Theory, Theoretical Computer Science.
*From September 1996 to June 2002*
Working as an Assistant Professor, in Mathematical Sciences at NIST, Berhampur. Teaching various courses in Mathematics and Computer Science (Optimization, Discrete Mathematics, Fuzzy Mathematics, Numerical Analysis, Applied Functional Analysis, Finite Automata, Artificial Intelligence, Complex Analysis, Engineering Mathematics, etc.). Conducting research on Applied Functional Analysis and Optimization, Computational Mathematics, Fuzzy Set Theory, Theoretical Computer Science etc.

*From April 1998 to July 1999*
Working as a Visiting Professor in the Department of Mathematics & Statistics Old Dominion University, Virginia, USA in the field of Optimization under BOYSCAST fellowship for post doctoral research (funded by DST, Government of India).

*February 1991 to September 1996*
Research Scholar from February 1991 to August 1991(funded by Utkal University), working on Fractional Calculus at
**Department of Mathematics, Utkal University, Bhubaneswar**, India.
Research Scholar from August 1991 to June 1993 (course work on Analysis, Algebra and Algebraic Topology) at **Tata Institute of Fundamental Research, Bombay, India**.
Research Scholar from August 1993 to September 1996 (working on Applied Functional Analysis and Optimization at **IIT, Kharagpur, India**.

*July 1989 to December 1990*
Working on the M.Phil. project on Locally Univalent Functions with locally Univalent derivatives at **Utkal University, Bhubaneswar, India**

*Various Visits and training totalling about 5 weeks*

- Short-Term Course on Fuzzy decision Making and Logic Programming from June 23-30, 1997 at Department of Mathematics, IIT Kharagpur.
- AICTE summer School on System Techniques and Computer Applications in water Resources from June 30th 1997 to 11th July 1997 at Department of Civil Engineering, IIT Kharagpur.
- QIP Sponsored short term course on Multi-Criteria decision making A computer oriented approach June 5-17, 1995 at Department of Mathematics, IIT Kharagpur.

**Educational Background**

Ph.D. in Mathematics from Indian Institute of Technology, Kharagpur, May 1997.
*Dissertation title:* Duality in Control, Variational and Mathematical Programming Problems with Generalized Invexity.
M.Phil. Mathematics (Specialization in Complex Analysis) from Utkal University, December 1990.
*Dissertation title:* Locally Univalent Functions with locally Univalent derivatives.
M.Sc. Mathematics (Specialization in Complex Analysis and Numerical analysis) from Utkal University, post graduated in first class in July 1988.
B.Sc. (Mathematics Honours) from Utkal University, graduated in first class honours and distinction in April 1986.

**Professional Affiliations**

Virginia Academy of Science, USA (Member)
Indian Science Congress Association (ISCA)(Life Member)
Operational Research Society of India (Life Member)
Orissa Mathematical Society (Life Member)

**PhD Thesis Supervised**

1. Mrs. Narmada Behera (2008) (jointly with Prof. S. Nanda)
2. Mrs. Shanta Kumari Sunanda (2008) (jointly with Prof. S. Nanda)
3. Mr. Saroj Kumar Padhan (2011)
4. Mrs. Payel Mandal (2012)
5. Mr. Bhagirathi Nayak (North Odisha University) (2012)
6. Mr. Nihar Mahato (2013)
7. Mr. Nabin Kumar Sahu (2014) (jointly with Prof. S. Nanda)
8. Mrs. Shreyasi Jana (2016)
9 . Koushik Das (2017)
10. Prashanta Majee (2018)
11. Mrs Neelam Singha (2018)
12. Mr. Rudrajit Sadhu (2020)

13. Mr. Sudipta Ku Ghosh (2022)

**Honours and Academic Awards**

- On going (SERB) MATRICS Project "On new Characterization of Approximation & Optimization via Exact Penalty function $P_\alpha$ in Hilbert space"(2023-26)
- Completed the CSIR project "Studies on the Equilibrium Problems under Generalized Convexity and Generalized Monotonicity in Banach Spaces", CSIR, Govt. India (2008-2011)
- Completed the ISIRD Research Project "Studies on the Analysis of Global Approximate Newton Method" ISIRD, SRIC, IIT Kharagpur, (2004-07)
- Completed the DST Project entitled "Studies on the Unconstrained Reformulation of Constrained Optimal Control Problems" under SERC Fast Track Proposals for Young Scientists 2001-02 scheme (Dept, of Science & Technology, Govt. of India) (2002-05)
- Orissa Young Scientists Award for the year 1998 in Physical Sciences.
- BOYSCAST fellowship 1997-98 (Dept. of Science & Technology, Govt. of India)
- One paper presented under (ISCA) Young Scientists Award Programme in Mathematics Section, 85th Indian Science Congress at Hydrabad in year 1998.
- National Eligibility Test qualified(NET) (by all India National level test).
- GATE 1993 Qualified (by all India National level test).

**Administrative Responsibilities Taken**

- Advanced Calculus Coordinator (2020-21), (2021-22)
- Maths-I Coordinator (2014-15), (2017-18)
- Warden for the year (2015-19)
- Assistant Warden for the year (2011-14)
- NSS office for the year (2008-10)
- Faculty-in-Charge of Tabulations M Tech Examinations
- Faculty-in-Charge of Departmental Examinations
- Faculty-in-Charge of Departmental Time-Table

- Faculty-in-Charge of Departmental Library
- Faculty Advisor for 5yrs Integrated Mathematics and Computing
- Members in Computer, PG&S, and Purchase Committee.

**Other Responsibilities Taken at IIT Campus:**

- In charge of maintenance of of Block 1 and 2 of Y-shaped multi-stored flat.
- Working for SMILE school in the campus.

**Referees**

Prof. M A Qazi Department of Mathematics, Tuskegee University Tuskegee, Alabama 36088, USA Phone: 334-727-8139 E-mail: mqazi@tuskegee.edu

Prof. Ram N. Mohapatra, Mathematics Department University of Central Florida Orlando, FL 32816, USA Phone: 1- (407) 823-5080 Fax : 1-(407)823-6253 E-mail: ramm@mail.ucf.edu

Prof. S. Nanda, Professor of Eminency & Research Head KIIT University, Bhubaneswar, India Mobile: 08763004008 E-mail: snanda@kiit.ac.in

Prof. Ravi A. Rao, School of Mathematics, TIFR, Bombay, Navy Nagar, India-400005, Phone:(91)22-22782000 Fax(91)-22 22804610 E-mail : ravi@math.tifr.res.in

**List of Publications attached**

**Passport Number:M8747852 (Republic of India)**

**List of Publications**
**Dr. CHANDAL NAHAK, Ph.D.**
**INDIAN INSTITUTE OF TECHNOLOGY**
**KHARAGPUR**

## IN JOURNALS

*Published:*

1. On well-posedness of Inverse Mixed variational Inequality Problems, (Accepted) JNCA (2023)(K. Mahalik, C. Nahak and R. P. Agarwal)

2. Study of implicit relation in $w$-distance and $(\eta, \theta, Z, \phi)\beta$ contraction in wt-distance with an application, Fixed Point Theory, 24(1), pp. 185-212 (2023) (S. K. Ghosh, C. Nahak, and R. P. Agarwal)

3. Existence of quadruple fixed point results in ordered $K$-metric space through $c$-distance with application in integral equation, Book Chapter in Studies in Computational Intelligence Vol 1042 (2023)(S. K. Ghosh and C. Nahak)

4. Solutions of parametric set-valued optimization problems of higher- order. Optimization, Book Chapter in Decision-making and Information Security (Accepted) (2022)(K. Das K and C. Nahak)

5. Fixed point results using weak $\alpha_w$-admissible mapping in $G_b$-metric spaces with applications. Revista de la Real Academia de Ciencias Exactas, Fsicas y Naturales. Serie A. Matemticas, RACSAM, 116(1),pp.1-27 (2022) (S. K. Ghosh, C. Nahak, and R. P. Agarwal)

6. Existence Results for a Class of Variational Quasi-Mixed Hemivariational-Like Inequalities, Bull. Malays. Math. Sci. Soc. https://doi.org/10.1007/s40840-021-01214-8(2022) (K. Mahalik and C. Nahak)

7. Approximation and Optimization, J. OMS, 40(01-02), pp.124-137(2021) (C. Nahak)

8. Duality of control problems in general Banach spaces, Int J. Operational Research,42(3),pp. 358-370(2021)

9. Parametric set-valued optimization problems under generalized cone convexity, Jnanabha 51(1), pp.1-11 (2021)(K. Das K and C. Nahak)

10. An extension of Karapinar and Sadaranganis' result through the C-class functions by using -admissible mapping with applications,FILOMAT, 35(3), pp.973-993 (2021)(S. K. Ghosh and C. Nahak)

11. Set-valued optimization problems under cone convexity, U.P.B. Sci. Bull., Series A 83(4), 69-82 (2021) (K. Das, C. Nahak and D. Roy)

12. Set-valued optimization problems via second-order contingent epiderivative, Yugosl. J. Oper. Res 31 75-94 (2021)(K. Das K and C. Nahak)

13. An extension of Lakzian-Rhoades results in the structure of ordered $b$-metric spaces via $wt$-distance with an application AMC 378 125-197 (2021)(S. K. Ghosh and C. Nahak)

14. Fixed point theorems on generalized $\alpha-$ nonexpansive multivalued mappings, The Journal of analysis - (2021)(R. Sadhu, P. Majee and C. Nahak)

15. Solvability of implicit semidefinite and implicit copositive complementarity problems, CAM 382 - (2021)(K. Mahalik and C. Nahak)

16. Sufficiency and duality in set-valued optimization problems under $(p;r)-\rho-(\eta;\theta)$-invexity, Acta Univ. Apulensis 62 93-110 (2020)(K. Das and C. Nahak)

17. Sufficiency and duality of set-valued semi-infinite programming problems under generalized cone convexity, Acta Univ. M. Belii Ser. Math. 2020, 95-111 (2020) 2020 95-111 (2020)(K. Das and C. Nahak)

18. Optimality conditions for set-valued minimax fractional programming problems, SeMA Journal 77 161-179 (2020)(K. Das and C. Nahak)

19. A descent method for variational inequalities in a Hilbert space, U.P.B. Sci. Bull., Series A 82(2), 2020 ISSN 1223-7027 82 - (2020)(R. Sadhu and C. Nahak)

20. $\alpha$-Fractionally convex functions, Fractional Calculus and Applied Analysis 23 534-552 (2020)(N. Singha and C. Nahak)

21. Convex optimization on Riemannian Manifolds, Dynamics of Continuous, Discrete and Impulsive Systems Series B: Applications & Algorithms 27 411-420 (2020)(S. Jana and C. Nahak)

22. Optimality conditions for set-valued minimax programming problems via second-order contingent epiderivative, Journal of Scientific Research 64 313-321 (2020)(K. Das and C. Nahak)

23. Solvability of the System of Implicit Generalized Order Complementarity Problems, Filomat 34 4659-4668 (2020)(K. Mahalik and C. Nahak)

24. An exact convex reformulation of the quadratic programming, Journal of Advanced Mathematical Studies 12 230-239 (2019)(R. Sadhu and C. Nahak)

25. Convex optimization on Riemannian Manifolds, Dynamics of Continuous, Discrete and Impulsive Systems Series (DCDIS) Series A) to appear - (2019)(S. Jana and C. Nahak)

26. Generalized nonexpansive multivalued mappings in CAT(0) space, Journal of Advanced Mathematical Studies 12 268-283 (2019)(R. Sadhu and C. Nahak)

27. Jacobi and Legendre variational tests for a class of generalized fractional variational problem, Rendiconti del Circolo Matematico di Palermo Series 2 - (2019)(N. Singha and C. Nahak)

28. An exact convex reformulation of the quadratic programming, Journal of Advanced Mathematical Studies (J. Adv. Math. Stud), 12 (2019)230-239 (R. Sadhu and C. Nahak)

29. Solutions of the Generalized Abels Integral Equation Using Laguerre Orthogonal Approximation, "to appear" Applications and Applied Mathematics: An International Journal (AAM) 2019 (N.Singha and C. Nahak)

30. Jacobi and Legendre variational tests for a class of generalized fractional variational problem, Rendiconti del Circolo Matematico di Palermo Series 2 https://doi.org/10.1007/s12215-018-0381-7 (N.Singha and C. Nahak)

31. A numerical method for solving a class of fractional optimal control problems using Boubaker polynomial expansion scheme, Filomat, 32(13), 4485-4502 (2018) (N. Singha and C. Nahak)

32. P. Majee, C. Nahak, Inertial algorithms for a system of equilibrium problems and fixed point problems, Rend. Circ. Mat. Palermo, II. Ser (2019) 68:11-27

33. On inertial proximal algorithm for split variational inclusion problems, Optimization 67(10), 1701-1716 (2018) (P. Majee and C. Nahak) SCIE

34. A modified iterative method for split problem of variational inclusions and fixed point problems, Computational and Applied Mathematics, 37(4):4710-4729 (2018)

35. A modified iterative method for a finite collection of non-self mappings and a family of variational inequality problems, Mediterr. J. Math. (2018) 15(2) 58- DOI 10.1007/s00009-018-1104-1 (P. Majee and C. Nahak) SCIE

36. A modified iterative method for capturing a common solution of split generalized equilibrium problem and fixed point problem, Revista de la Real Academia de Ciencias Exactas, Fsicas y Naturales.(RACSAM) Serie A. Matemticas 112(4), 1327-1348 (2018), DOI 10.1007/s13398-017-0428-1 (P. Majee and C. Nahak)

37. Equilibrium and Mixed Equilibrium Problems Under Weak Monotonicity on Hadamard Manifold, Commun. Optim. Theory 2018 (2018), Article ID 4 (S. Jana and C. Nahak)

38. A Study of Equilibrium Problems and Variational Inequality Problems on Hadamard Manifold, J. Orissa Math. Soc. Vol. 36(2017), No. 01-02, 97-123 (S. Jana and C. Nahak)

39. An Efficient Approximation Technique for Solving the Class of Fractional Optimal Control Problems, J Optim Theory Appl DOI 10.1007/s10957-017-1143-y (2017) (N.Singha and C. Nahak)
**Impact Factor: 1.289**

40. New generalized mixed vector variational-like inequalities with semi-$\eta$-pseudomonotonicity, Int. J. Mathematics in Operational Research (IJMOR), Vol. 13, No. 1, 2018 Inder Science (P. Majee and C. Nahak)

41. Equilibrium and Mixed Equilibrium problems on Hadamard Manifolds "to appear" International Journal of Mathematics in Operational Research (IJMOR) Inder-Science 2017 (S. Jana and C. Nahak)

42. A hybrid viscosity iterative method with averaged mappings for split equilibrium problems and fixed point problems, Numer Algor 74(2017), 609635vDOI 10.1007/s11075-016-0164-1. (P. Majee and C. Nahak)
**Impact Factor: 1.417**

43. Optimization Problems with difference of set valued maps under generalized cone convexity, J. Appl. Math. Inform., 35(2017), 147-163.(K. Das and C. Nahak)

44. Optimality Conditions and Duality Results in Banach Space under $\rho - (\eta, \theta)$-B-Invexity, Opsearch 54(2017), 107-121. (N.Behera, C. Nahak and S. Nanda)

45. Third order duality in nonlinear programming problems, 4OR-Q. J. Ope. Res. 15(2017), 93-105. (S. K. Padhan and C. Nahak)

46. A Numerical Scheme for Generalized Fractional Optimal Control Problems, Appl. Appl. Math 11(2016), No. 2, 798-814. (N. Singha and C. Nahak)

47. Three Fundamental Theorems of Functional Analysis Revisited, The Mathematics Student, 85(2016), Nos. 3-4,, 67-72(C. Nahak)

48. Set-valued minimax programming problems under generalized cone convexity, Rend. Circ. Mat. Palermo, (2016), pp. 1-20, DOI 10.107/s40324-016-0099-4.(K. Das and C. Nahak)

49. Approximate quasi efficiency of set-valued optimization problems via weak subdifferential, SeMA J. (2016), pp.1-20, DOI 10.1007/s40324-016-0099-4.(K. Das and C. Nahak)

50. Control problems with Kuhn-Tucker and Fritz John Generalized Invexity, Journal of Mathematical Analysis, 7(2016), No. 3 51-57. (S. K. Padhan and C. Nahak and M. Postolache)

51. Calculus of Variations with Combination of Classical and Fractional Operators, Non Linear Functional Analysis & Applications, 21(1016), No 2. 798-814) (N. Singha and C. Nahak)

52. A New Class of Generalized Monotone Mappings and Variational Inclusion Problems in Banach Spaces,DCDIS, Mathematical Analysis, 23(2016), 447-463. (N. K. Sahu, R. N. Mohapatra, C. Nahak and N. K. Mahato).

53. A projection-type method for set valued variational inequality problems on Hadamard Manifolds, Mediterranean Journal of Mathematics, 13(2016), No. 6, 3939-3953. (S. Jana and C. Nahak)
**Impact Factor: 0.656**

54. Sufficiency of Karush-Kuhn-Tucker Conditions and Duality Results inn Banach Space under Generalized $\rho$-$(\eta;\theta)$-invexity, Non Linear Functional Analysis & Applications (NFAA) 21(2016), No.2 225-233 (N.Behera, C.Nahak and S.Nanda)

55. Optimality conditions for approximate quasi efficiency in set-valued equilibrium problems, SeMA J., 73(2016), 183-199. (K. Das and C. Nahak)

56. Extended new generalized mixed vector variational-like inequalities in reflexive Banach spaces, OPSEARCH 53(2016), 934949 DOI 10.1007/s12597-016-0254-9. (P. Majee and C. Nahak)

57. Generalized Vector Equilibrium Problems on Hadamard Manifolds, J. Nonlinear Sci. Appl. 9 (2016), 1402-1409 (2016) (S. Jana, C. Nahak and C. Ionescu)
**Impact Factor: 1.0756**

58. Mixed Equilibrium Problems on Hadamard Manifolds, Rend. Circ. Mat. Palemo 65(2016), 97-109, DOI 10.1007/s12215-015-0221-y (S. Jana and C. Nahak)

59. Control Problems under $(p,r)-\rho-(\eta,\theta)$-Invexity, Rend. Circ. Mat. Palermo, DOI 10.1007/s12215-015-0200-3 (2015) (P. Mandal and C. Nahak)

60. Sufficiency and duality of set-valued optimization problems via higher-order contingent derivative, J. Adv. Math. Stud. 8 (2015) 137-151 (K. Das and C. Nahak)

61. Set-valued fractional programming problems under generalized cone convexity, Opsearch, 53(2016), 157-177. (K. Das and C. Nahak)

62. Geodesic $\eta$-invex and semi-strictly geodesic $\eta$-invex functions on Riemannian Manifold, doi: 10.17114/j.aua.2015.41.04, pp. 51-60, Acta Universitatis Apulensis (2015) (S. Jana and C. Nahak)

63. Second-order duality for invex composite optimization, Journal of the Egyptian Mathematical Society, 23 (2015) 149-154 (S. K. Padhan and C. Nahak)
**Citation: 02**

64. Higher-order symmetric duality with higher-order generalized invexity, J. Appl. Math. Comput. 48 (2015) 407420 (S. K. Padhan and C. Nahak)

65. Approximation solvability of a class of A-monotone implicit variational inclusion problems in semi-inner product spaces, Appl. Math. Comput., 236 (2014) 109-117 (N. K. Sahu, R. N. Mohapatra, C. Nahak and S. Nanda)
**Impact Factor: 1.378**
**Citation: 02**

66. Sufficient optimality conditions and duality theorems for set-valued optimization problem under generalized cone convexity, Rend. Circ. Mat. Palermo, DOI 10.1007/s 12215-014-0163-9 (2014) (K. Das and C. Nahak)
**Citation: 01**

67. Variational problems and $l_1$ exact exponential penalty function with $(p, r)-\rho-(\eta, \theta)$-invexity, Advanced Modeling and Optimization (AMO), Volume 16 (2014) No 1, 243-259 (P. Mandal, B. C. Giri and C. Nahak)

68. Equilibrium problems with generalized relaxed monotonicities in Banach spaces, Opsearch, 51(2014), no. 2, 257-269 (N. K. Mahato and C. Nahak)
**Citation: 03**

69. Graph Convergence and Approximation Solvability of a Class of Implicit Variational Inclusion Problems in Banach Spaces, J. of Indian Math. Society, 81 No (1-2) (2014) 155-172 (N. K. Sahu, C. Nahak and S. Nanda)
**Citation: 01**

70. Optimality Conditions and Duality Results of the Nonlinear Programming Problems under $\rho-(p, r)$-Invexity on Differentiable Manifolds, J. Appl. Math. and Informatics 32(2014) No. (3-4) 491-502 (S. Jana and C. Nahak)
**Citation: 01**

71. Optimality Conditions and Duality Results of the Nonlinear Programming Problems under $(p, r)$-Invexity on Differentiable Manifolds, Balkan Society of Geometers (BSG) Proceedings 21(2014) 84-95 (S. Jana and C. Nahak)

72. Approximation solvability of a class of A-monotone variational inclusion problems in semi-inner product spaces, Dynamics of Continuous, Discrete and Impulsive Systems(DCDIS) Series A: Mathematical Analysis, 20 (2013) 227-240 (N. K. Sahu, C. Nahak, R. N. Mohapatra and S. Nanda)

73. Mixed equilibrium problems with relaxed $\alpha$-monotone mapping in Banach spaces, Rend. Circ. Mat. Palermo, 62 (2013), no.2, 207-213 (N. K. Mahato and C. Nahak)
**Citation: 05**

74. Higher-Order generalized invexity in variational problems, Math. Methods Appl. Sci., 36 (2013), no.11, 1334-1341 (S. K. Padhan and C. Nahak)
**Impact Factor: 0.918**

75. The extended F-implicit complementarity and variational inequality problems in semi-inner product spaces, Acta Universitatis Apulensis, 35 (2013) 111-123 (N. K. Sahu, C. Nahak and S. Nanda)

76. Minmax programming problems with $(p, r) - \rho - (\eta, \theta)$-invexity, Int. J. Math. Oper. Res., 5 (2013), no.1, 121-143 (P. Mandal and C. Nahak)

77. Vector equilibrium problems with new types of generalized monotonicity mappings, Yugoslav J. Oper. Res., 23 (2013), no.2, 213-220 (N. K. Mahato and C. Nahak)

78. Second-and higher-order generalized invexity and duality in mathematical programming, Int. J. Math. Oper. Res., 5 (2013), no.2, 170-182 (S. K. Padhan and C. Nahak)

79. Hybrid projection methods for the general variational-like inequality problems, J. Adv. Math. Stud., 6 (2013), no.1, 143-158 (N. K. Mahato and C. Nahak)

80. Numerical range of two operators in semi-inner product spaces, Abstr. Appl. Anal. 2012, Art. ID 846396, 13pp. (N. K. Sahu, C. Nahak and S. Nanda)
**Impact Factor: 1.102** by Thomson Reuters (ISI) in 2013

81. Nonsmooth $\rho$-$(\eta, \theta)$-invexity in multiobjective programming problems, Optim. Lett., 6 (2012), no.2, 253-260 (C. Nahak and R. N. Mohapatra)
**Impact Factor: 0.934 Citation: 17**

82. Weakly relaxed $\alpha$-pseudomonotonicity and equilibrium problem in Banach spaces, J. Appl. Math. Comput., 40 (2012), no.1-2, 499-509 (N. K. Mahato and C. Nahak)
**Citation: 06**

83. The $l_1$ exact exponential penalty function method with $(p,r)-\rho-(\eta,\theta)$-invexity, J. Adv. Math. Stud., 5 (2012), no.1, 127-148 (P. Mandal and C. Nahak)
**Citation:03**

84. Variational-like inequalities and equilibrium problems with generalized monotonicity in Banach spaces, Adv. Oper. Res., 2012, Art. ID 648070, 15 pp. (N. K. Mahato and C. Nahak)
**Citation: 03**

85. Generalized $(\rho,\theta)-\eta$-Invexity and Generalized $(\rho,\theta)-\eta$-Monotonocity, Indian Jn. of Indus. and Appl. Maths. 3(2012), pp. 74-86 (N . Behera, C. Nahak and S. Nanda)

86. Symmetric duality with $(p,r)-\rho-(\eta,\theta)$-invexity, Appl. Math. Comput., 217 (2011), no.21, 8141-8148 (P. Mandal and C. Nahak)
**Impact Factor: 1.378 Citation: 19**

87. Higher-order symmetric duality in multiobjective programming problems under higher-order invexity, Appl. Math. Comput., 218 (2011), no.5, 1705-1712 (S. K. Padhan and C. Nahak)
**Impact Factor: 1.378 Citation: 05**

88. Higher-order generalized invexity in control problems, J. Control Sci. Eng., 2011, Art. ID 127208, 9 pp. (S. K. Padhan and C. Nahak)
**Citation: 01**

89. Second and higher order duality in Banach space under $\rho-(\eta,\theta)$-invexity, Nonlinear Anal. Hybrid Syst., 5 (2011), no.3, 457-466 (S. K. Padhan, C. Nahak and R. N. Mohapatra)
**Impact Factor: 2.375 Citation: 03**

90. Equilibrium problem under various types of convexities in Banach spaces, J. Math. Comput. Sci., 1 (2011), no.1, 77-78 (N. K. Mahato and C. Nahak)
**Citation: 04**

91. Optimality conditions and duality for multiobjective variational problems with generalized $\rho-(\eta,\theta)$-B-Type-I functions, J. Control Sci. Eng., 2011, Art. ID 497376, 11 pp. (C. Nahak and N. Behera)

92. A new generalization of Hardy-Hilbert's inequality, J. Indian Math. Soc. (N.S.), 77 (2011), no.1-4, 195-206 (S K Sunanda, C. Nahak and S. Nanda)

93. Benchmarking Performance of Public Sector Banks in India, The IUP Journal of Bank Management, 10 (2011), no.2, 57-76 (B. Nayak and C. Nahak) **Citation: 01**

94. Forcasting of Financial Markets- Applications of Fuzzy Association, International Journal Research in Commerce, IT and Management (IJRCM) Vol 2 Issue. 5, 1-8 (2011) (B. Nayak and C. Nahak and A. K. Misra)

95. Second order duality for the variational problems under $\rho-(\eta,\theta)$-invexity, Comput. Math. Appl., 60 (2010), no.12, 3072–3081 (S. K. Padhan and C. Nahak)
**Impact Factor: 1.697 Citation: 07**

96. Some new inequalities similar to Hardy-Hilbert inequality, Math. Inequal. Appl., 13 (2010), no.3, 601-611 (S. K. Sunanda, C. Nahak and S. Nanda)
**Impact Factor: 0.645**

97. Generalized Hardy-Hilbert's inequality, Commun. Appl. Anal., 14 (2010), no.3-4, 481–489 (S. K. Sunanda, C. Nahak, and S. Nanda)

98. $d-\rho-(\eta,\theta)$-invexity in multiobjective optimization, Nonlinear Anal., 70 (2009), no.6, 2288-2296 (C. Nahak and R. N. Mohapatra)
**Impact Factor: 1.327 Citation: 20**

99. Regularized gap function as penalty term for constrained minimization problems, J. Math. Anal. Appl., 354 (2009), no.2, 575-583 (W. Li and C. Nahak)
**Impact Factor: 1.120**

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