MY CURRICULUM VITAE

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Current Role Description

Now I am working as a Lecturer in the **Department of Mathematics, Ravenshaw University, Cuttack, India**.

Professional Experience

I started my teaching from the Department o f Mathematics, Larambha College, Larambha as a lecturer. After that I joined in the Department of Mathematics, University College of Engineering, Burla as a lecturer (contractual basis) from September 2005 to December 2005. From January, 2008, to January, 2011I, was taking tutorial classes in Engineering Mathematics-I and Engineering Mathematics-II for undergraduate courses at IIT Kharagpur, India. Now I am working as a lecturer in the Department of Mathematics, Ravenshaw University, Cuttack from 23rd April, 2011.

Education Summary

Degree	Institute	Major and Specialization	Year	Division
PhD(Maths)	IIT Kharagpur	Applied Functional Analysis and Optimization	2011	Awarded
MPhil(Maths)	Sambalpur University	Advanced Functional Analysis, Operator Theory	2005	First
MA (Maths)	Sambalpur University	Complex Analysis, Functional Analysis, Partial Differential Equation, Operation Research	2003	First
BA(Maths)	GM College, Sambalpur	Mathematics, Economics	2001	First

Courses Attended

Year	Title of Course	Location	Organized By
2007	Computational Functional Analysis	Kharagpur	Math Dept., IIT Kharagpur
2007	Graph Theory and Algorithm	Kharagpur	Math Dept., IIT Kharagpur
2007	Computer Programming	Kharagpur	Math Dept., IIT Kharagpur

Personal Information

Mother's Name	Kishori Padhan
Father's Name	Adhikari Padhan
Date of Birth:	15th July 1980
Nationality:	Indian
Sex:	Male
Marital Status:	Married
Language:	English, Bengali, Hindi and Oriya
Personality Traits:	Creative, Determined & Consistent
Passport No:	HO173544

Research Plan

In course of the study, several interesting problems come into existence, which require further investigation.

- Certain second and higher order generalized invex functions are defined in subsets of $\mathbb{R}^n$ and $\mathbb{R}^m$, respectively and appropriate second and higher order duality results are established. It will be useful if one generalizes the domain of the functions from finite dimensional subsets to infinite dimensional Banach spaces.

- We introduce generalized $\rho-(\eta,\theta)-$invexity for the variational problems and establish desired second and higher order duality results. The functions involve in the variational problem are defined in $\mathbb{R}^n$. One may enlarge the domain of the functions to infinite dimensional Banach spaces. Furthermore, one can study the symmetric duality of the variational problems under this generalized invexity assumptions.

- State and control variables are defined in $\mathbb{R}^n$ and $\mathbb{R}^m$, respectively. The duality theorems between control primal problem and their corresponding second and higher order dual problems are established. One can generalize these results for infinite dimensional Banach spaces where the state and control variables are are defined. It will be worthwhile to study the complementarity formulation to obtain some algorithms and necessary computer programs to find the solutions. Moreover, the study of second and higher order symmetric duality of the control problems in Banach spaces will be a good area of future research.

- We introduce generalized $\rho-(\eta,\theta)-$invex functions between Banach spaces and establish the second and higher order duality results under generalized $\rho-(\eta,\theta)-$invexity assumptions. One can study the second and higher order symmetric duality results in general Banach spaces.

Our work deals with differentiable functions only. The term non-smooth optimization was coined in 1970. Non-smooth analysis deals with the study of functions which are continuous though not differentiable. Non-smoothness does not appear arbitrarily but usually appear through some process of maximization and minimization. In the year 1986, Craven had studied nondifferentiable symmetric dual problems in which the functions *f* is assumed to be locally, Lipschitz, and satisfying the convexity hypothesis. Then *f* is differentiable almost everywhere, but second derivatives need exist at all. The gradient $f_x(x,y)$ and $f_y(x,y)$ are now replaced by subdifferentials (Clarke generalized gradient) $\partial_x f(x,y)$ and $\partial_y f(x,y)$. A group of people are working in non-smooth mathematical programming. It is useful if one studies second and higher order duality and optimality in variational and control problems for nondifferentiable functions for single and multiobjective problem cases. Moreover, the study of second and higher order symmetric duality of the non-smooth optimization problems in general Banach space is a good area for further research.

Publications

1. S. K. Padhan and C. Nahak, Higher Order Generalized Invexity in Control Problems, ***Journal of Control Science and Engineering***, 2011 (to appear).

2. S. K. Padhan and C. Nahak, Second Order Duality for the Variational Problems under $\rho-(\eta,\theta)-$invexity, ***Computer and Mathematics with Applications,*** 60 (2010) 3072-3081.

3. S. K. Padhan, C. Nahak and R. N. Mohapatra, Second and Higher Order Duality in Banach space under $\rho-(\eta,\theta)-$invexity, ***Nonlinear Analysis: Hybrid System***., (2010), (to appear).

4. S. K. Padhan and C. Nahak, KT-$\rho-(\eta,\theta)-$invex and FJ-$\rho-(\eta,\theta)-$invex control problem ***International Journal of Optimization: Theory, Methods and Applications***, (2010) (to appear).

5. S. K. Padhan and C. Nahak, Second order duality for the control problems under $\rho-(\eta,\theta)-$invexity, ***International Journal of Optimization: Theory, Methods and Applications***, 1 (2009) 302-317.

6. S. K. Padhan and C. Nahak, Symmetric duality with generalized invexity in variational problems, ***Journal of Orissa Mathematical Society***, 27 (2008) 81-86.

7. S. K. Padhan and C. Nahak, Mangasarian second and higher order duality in Banach space (Communicated to ***Acta Mathematica Scientia***).

8. S. K. Padhan and C. Nahak, Higher-order symmetric duality with generalized invexity (Communicated to ***Bulletin of Brazilian Mathematical Society, News Series***).

9. S. K. Padhan and C. Nahak, Higher-order symmetric duality in multiobjective programming problems under higher-order invexity (Communicated to ***Applied Mathematics and Computation***).

10. S. K. Padhan and C. Nahak, Second and higher order generalized invexity and duality in mathematical programming (Communicated to ***Computer and Mathematics with Applications***).

11. S. K. Padhan and C. Nahak, Second and higher order duality for the variational problems in Banach Space under $\rho-(\eta,\theta)-$ invexity (Communicated to ***Journal of Convex Analysis***).

Book Chapter

S. K. Padhan and C. Nahak, Second Order Symmetric Duality with Generalized invexity, One chapter of the book "Recent Contributions on Nonconvex Optimization", **Springer Publ**., 2010.

Conferences

1. S. K. Padhan and C. Nahak, Second-order duality for the invex composite function, International Conference on Operations Research Applications in Engineering and Management (ICOREM- 2009), Anna University, Tiruchirappalli, India.

2. S. K. Padhan and C. Nahak, KT- generalized invex and FJ- generalized invex control problem, International Conference on Challenges and Applications of Mathematics in Science and Technology (CAMIST-2010), National Institute of Technology Rourkela, India.

3. S. K. Padhan and C. Nahak, Second and higher order generalized invexity and duality in mathematical programming, A mini Conference on Function Theory and Applications, KIIT University, Bhubaneswar, India, 2010.

Workshops Attended

1. Research Workshop in Optimization Theory and Appliocations, September 3-6, 2008, Indian Institute of Technology Kanpur.

2. Advanced Training Programme on Nonconvex Optimization and Its Applications, March 22-26, 2009, Banaras Hindu University, Varanasi.

Saroj Kumar Padhan

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