

## Editorial

# Variational Inequalities and Vector Optimization 2014

Xian-Jun Long,<sup>1</sup> Jian-Wen Peng,<sup>2</sup> Nan-Jing Huang,<sup>3</sup> and Jen-Chih Yao<sup>4</sup>

<sup>1</sup>College of Mathematics and Statistics, Chongqing Technology and Business University, Chongqing 400067, China

<sup>2</sup>School of Mathematics, Chongqing Normal University, Chongqing 400047, China

<sup>3</sup>Department of Mathematics, Sichuan University, Chengdu, Sichuan 610064, China

<sup>4</sup>Center for Fundamental Science, Kaohsiung Medical University, Kaohsiung 807, Taiwan

Correspondence should be addressed to Xian-Jun Long; xianjunlong@hotmail.com

Received 23 November 2014; Accepted 23 November 2014; Published 21 December 2014

Copyright © 2014 Xian-Jun Long et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

In the last three decades, the theory of variational analysis provides very effective and powerful techniques for studying a wide class of problems arising in nonlinear equations, optimization problems, economics equilibrium, game theory, complementarity problems, and fixed point problems, as well as other branches of mathematics and engineering sciences. So, the thorough study of both theory and methods about variational inequalities will help us to find new techniques for solving the practical problem.

Vector optimization problems have received much attention by many authors due to their extensive applications in many fields such as biology, economics, optimal control, and differential inclusions.

Because of the importance and active impact of the variational inequality and the vector optimization problem in the nonlinear analysis and optimization, this special issue, focusing on most recent contributions, includes works on variational inequalities, equilibrium problems and nonexpansive mappings, vector optimization problems and generalized convex functions, robust optimization problems, and optimization problems with applications, which are based on a strict international peer review procedure and our original proposal. A brief review of the papers is given under the following four topics.

(1) Variational inequalities, equilibrium problems, and nonexpansive mappings

(i) “Triple hierarchical variational inequalities with constraints of mixed equilibria, variational inequalities, convex minimization, and hierarchical fixed point problems” by L.-C. Ceng et al.;

(ii) “An interior projected-like subgradient method for mixed variational inequalities” by G. J. Tang and X. Wang;

(iii) “Convex minimization with constraints of systems of variational inequalities, mixed equilibrium, variational inequality, and fixed point problems” by L. C. Ceng et al.;

(iv) “Weak convergence theorems for bregman relatively nonexpansive mappings in Banach spaces” by C. T. Pang et al.;

(v) “A new noninterior continuation method for solving a system of equalities and inequalities” by J. Zhu and B. Hao;

(vi) “Further investigation on the relaxed hybrid steepest-descent methods for variational inequalities with  $k$ -strict pseudocontractions” by Q.-F. Gong and D.-J. Wen;

(vii) “Iterative algorithms for new general systems of set-valued variational inclusions involving  $(A, \eta)$ -maximal relaxed monotone operators” by T. Xiong and H. Lan.

(2) Vector optimization problems and generalized convex functions

(i) “A characterization of E-Benson proper efficiency via nonlinear scalarization in vector optimization” by K. Q. Zhao et al.;

(ii) “Lower convergence of minimal sets in star-shaped vector optimization problems” by R. Hu;

- (iii) “*Geodesic B-preinvex functions and multiobjective optimization problems on Riemannian manifolds*” by S. Chen et al.;
- (iv) “*Semi-G-preinvexity and optimality in mathematical programming*” by Z. Y. Peng et al.;
- (v) “*Implicit multifunction theorems in Banach spaces*” by M. Yang and Y. Xu.

(3) Robust optimization problems

- (i) “*Robust linear programming with norm uncertainty*” by L. Wang and H. Luo;
- (ii) “*Distributionally robust joint chance constrained problem under moment uncertainty*” by K. Ding;
- (iii) “*Distributionally robust self-scheduling optimization with CO<sub>2</sub> emissions constraints under uncertainty of prices*” by M. R. Bai and Z. P. Yang.

(4) Optimization problems with applications

- (i) “*A novel filled function method for nonlinear equations*” by L. Yuan and Q. Tang;
- (ii) “*Fuzzy optimization of option pricing model and its application in land expropriation*” by A. Heng et al.;
- (iii) “*Global optimization for the sum of concave-convex ratios problem*” by X. G. Zhou and J. H. Yang;
- (iv) “*On-line booking policies and competitive analysis of medical examination in hospital*” by L. Luo et al.;
- (v) “*Reliability analysis of an extended shock model and its optimization application in a production line*” by R. Liu;
- (vi) “*Global optimality conditions for nonlinear programming problems with linear equality constraints*” by G. Li and Y. Wang;
- (vii) “*Grey game model for energy conservation strategies*” by S. H. Li;
- (viii) “*Solutions of second-order m-point boundary value problems for impulsive dynamic equations on time scales*” by X. Xu and Y. Wang.

## Acknowledgments

The editors of this special issue would like to express their gratitude to the authors who have submitted their papers for consideration and to the expert referees who provided them with invaluable help in the reviewing process.

*Xian-Jun Long  
Jian-Wen Peng  
Nan-Jing Huang  
Jen-Chih Yao*