

Nonlinear Analysis and Its Applications in Symmetry

Alexander Zaslavski

Department of Mathematics, The Technion—Israel Institute of Technology, Haifa 32000, Israel;
ajzasl@technion.ac.il

This Special Issue of *Symmetry* is devoted to recent advances in the nonlinear analysis and its applications.

In recent years, the growing significance of the nonlinear analysis and its applications has been realized, due not only to theoretical achievements in this area, but also because of its numerous applications to engineering, economics, biology, behavioral sciences, etc. It has become increasingly more evident that the nonlinear analysis is of crucial importance in mathematical sciences, with its ideas and methods having turned out to be essential tools in the analysis of nonlinear phenomena in many areas of mathematics. Among these areas, one can mention ordinary differential equations, partial differential equations, the nonlinear operator theory, calculus of variations, optimal control theory, optimization and mathematical economics.

The Special Issue contains ten papers contributed by researchers from China, Egypt, Greece, Israel, Kosovo, Poland, Romania, Saudi Arabia, Taiwan and Thailand, covering a wide spectrum of important problems and topics of current research interest. These topics include: the convergence results of differential variational inequality problems [1]; 2D and 3D visualization for the static bifurcations and nonlinear oscillations of a self-excited system with a time-delayed controller [2]; generic convergence results for infinite products of generalized nonexpansive mappings [3]; a modified Krasnosel'skii–Mann iterative algorithm for approximating fixed points of enriched nonexpansive mappings [4]; turnpike properties for dynamical systems determined by differential inclusions [5]; a modified Tseng's method for solving the modified variational inclusion problems [6]; existence and convergence results for the generalized mixed quasivariational hemivariational inequality problem [7]; solvability of generalized systems of time-dependent hemivariational inequalities enjoying a symmetric structure in reflexive Banach spaces [8]; a multiplicity theorem for superlinear double-phase problems [9] and control theory application for the swing up and stabilization of a rotating inverted pendulum [10].

We hope that this Special Issue comes to serve as a source of ideas for many mathematicians, mathematical physicists, economists and engineers interested in pursuing recent developments in the nonlinear analysis.

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References

1. Chang, S.-S.; Salahuddin; Wang, L.; Ma, Z. The Convergence Results of Differential Variational Inequality Problems. *Symmetry* **2022**, *14*, 760. [[CrossRef](#)]
2. Saeed, N.A.; Awrejcewicz, J.; Alkashif, M.A.; Mohamed, M.S. 2D and 3D Visualization for the Static Bifurcations and Nonlinear Oscillations of a Self-Excited System with Time-Delayed Controller. *Symmetry* **2022**, *14*, 621. [[CrossRef](#)]
3. Reich, S.; Zaslavski, A.J. Two Generic Convergence Results for Infinite Products of Generalized Nonexpansive Mappings. *Symmetry* **2022**, *14*, 534. [[CrossRef](#)]
4. Berinde, V. A Modified Krasnosel'skiĭ–Mann Iterative Algorithm for Approximating Fixed Points of Enriched Nonexpansive Mappings. *Symmetry* **2022**, *14*, 123. [[CrossRef](#)]
5. Zaslavski, A.J. Turnpike Properties for Dynamical Systems Determined by Differential Inclusions. *Symmetry* **2021**, *13*, 2326. [[CrossRef](#)]
6. Seangwattana, T.; Sombut, K.; Arunchai, A.; Sitthithakerngkiet, K. A Modified Tseng's Method for Solving the Modified Variational Inclusion Problems and Its Applications. *Symmetry* **2021**, *13*, 2250. [[CrossRef](#)]
7. Chang, S.-S.; Salahuddin; Wang, L.; Wang, G.; Zhao, Y. Existence and Convergence Results for Generalized Mixed Quasi-Variational Hemivariational Inequality Problem. *Symmetry* **2021**, *13*, 1882. [[CrossRef](#)]
8. Ceng, L.-C.; Fu, Y.-X.; Yin, J.; He, L.; He, L.; Hu, H.-Y. The Solvability of Generalized Systems of Time-Dependent Hemivariational Inequalities Enjoying Symmetric Structure in Reflexive Banach Spaces. *Symmetry* **2021**, *13*, 1801. [[CrossRef](#)]
9. Deręgowska, B.; Gasiński, L.; Papageorgiou, N.S. A Multiplicity Theorem for Superlinear Double Phase Problems. *Symmetry* **2021**, *13*, 1556. [[CrossRef](#)]
10. Bajrami, X.; Pajaziti, A.; Likaj, R.; Shala, A.; Berisha, R.; Bruqi, M. Control Theory Application for Swing Up and Stabilisation of Rotating Inverted Pendulum. *Symmetry* **2021**, *13*, 1491. [[CrossRef](#)]