Discrete Dynamics in Nature and Society

Special Issue on Approximate and Iterative Methods

Call for Papers

The iterative methods are very successful in descriptions of many issues and solving various problems in mathematics and its applications. They are based mainly on iterations of operators that satisfy some equations. But, on the other hand, the natural phenomena are subject to certain disturbances (noises) and their descriptions, in general, can be expressed by equations only approximately; that is, frequently instead of equations we rather should use inequalities. So, it is important to know when, why, and to what extent we can replace those inequalities with suitable equations. This is actually the issue of Ulam's type stability, which nowadays is understood as follows: under what conditions a function, which fulfils an equation, approximately, is close to a solution of the equation. Iterative methods are very useful in investigation of that type of stability. Also, some recent results concerning stability of the translation equation, dynamical systems, and their envelopes show that those approximate and iterative approaches can be combined together.

This special issue is focused not only on the mutual relations between the iterative methods and the approximate approach suggested by Ulam's type stability, but also on related issues. Articles containing the industrial and some other real-world applications are particularly welcome. The authors are invited to submit original research papers as well as review articles. Potential topics include, but are not limited to:

- Relations between the exact and approximate solutions of fractional (difference, differential, and integral) equations
- Composite and iterative type functional and difference equations (their exact and approximate solutions)
- Iterative procedures in operator theory
- Bifurcation theory for perturbed discrete dynamical systems
- Topological and symbolic dynamics
- Numerical stability analysis of iterative methods
- Ulam's type stability of various objects (equations, inequalities, homotopies, and flows)
- Hyperstability, superstability, and stability in various spaces and C*-algebras

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