Editorial

Ulam's Type Stability and Fixed Points Methods

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Considering the issue of stability of functional equations we follow a question raised in 1940 by S. M. Ulam concerning approximate group homomorphisms. The first partial answer to this question was given in a paper published in 1941 by D. H. Hyers.

The method used by Hyers (quite often called the *direct method*) has been successfully applied for study of the stability of large variety of equations. Apart from it, there are also several other efficient approaches to the Ulam type stability, using different tools. The second most popular technique of proving such stability results for (not necessarily functional) equations is the *fixed point method*. It was used for the first time in 1991 by J. A. Baker who applied a variant of Banach's fixed point theorem to obtain a stability outcome for a functional equation in a single variable. At present, numerous authors follow Radu's approach and make use of a theorem of Diaz and Margolis.

The Hyers-Ulam stability (or more generally, Ulam's type stability) theory is the subject of many papers as well as talks presented at various conferences. On June 2–6, 2014, the Department of Mathematics of the Pedagogical University of Cracow organized the *Conference on Ulam's Type Stability*, the first meeting dedicated in its entirety to this topic. Its 60 participants came from 16 countries.

This volume includes 10 research articles (a survey and 9 regular papers) containing the latest achievements in that type of stability and its connections to the fixed point theory. They have been written by 22 authors from 5 countries.

As usual, several contributors use in their studies the direct method.

Most of the papers deal with the stability of functional equations, and thus Pexider, quadratic, cubic, quadratic reciprocal, quadratic-additive type, quadratic-quartic type, and exponential with an involution equations are considered. These investigations concern classical normed spaces, non-Archimedean normed spaces, and random normed spaces.

Moreover, the volume provides some results on the stability of the differentiation operator on the Hilbert spaces of entire functions and on the stability and hyperstability of the Lie triple homomorphisms and derivations associated with a Cauchy-Jensen additive equation on normed Lie triple systems. There is also a paper on the convergence of sequences of fixed points (of some sequences of contraction mappings) in G-complete fuzzy metric spaces.

Finally, the volume contains a survey discussing applications of different fixed point theorems to the theory of stability of functional equations and the stability of the fixed point equation and its generalizations.

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