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Editorial

Abstract Fixed-Point Theorems and Fixed-Point Iterative Schemes

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Mathematical methods are extensively used in dealing with simulation and approximation problems related to computer science, engineering, physics, and many others. Such problems can be often modelled in the abstract form of an equation (algebraic, functional, and differential) and then proving that its solutions exist and can be exactly determined or approximately obtained. Fixed-point theory is one of the most relevant and popular tools used over the last decades for approaching the above-mentioned equations. A large amount of results establishing the existence and multiplicity of solutions for suitable equations can be proved using fixed-point arguments. In fact, these equations can be associated to a general fixed-point equation of the form $x = fx$ for a given mapping f; namely, we look for a point, x, with zero distance from its image, fx. Now, fixed-point theorems are not only confined to pure mathematics, but they also act as bridges beetween abstract theories and applications in sciences. Thus, the aim of this collection of papers is to cover some of the recent advancements in abstract research and in developing new useful applications. The specific topics mainly include both fixed-point theorems in generalized metric spaces and Banach spaces (see [1–7]) and fixed-point iterative schemes along with the convergence analysis of proposed solving algorithms (see [8–14]). In particular, we point the attention of the reader on the applications of fixed-point arguments to the context of various classes of differential equations (see [15–18]); for a similar approach to integral equations, see [19]. Finally, a complementary topic to that of fixed-point theories is the best proximity point theory. This theory arises naturally as a generalization of the concept of a fixed point and is relevant in the case where the mapping, f, under investigation is fixed-point-free; namely, we look for a point, x^*, such that the distance between x^* and fx^* reaches its minimum (see [7]).

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