Editorial

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It is our genuine pleasure to present the inaugural issue of the journal of *Granular Computing*. Granular Computing is a new, yet rapidly growing research area that encompasses the essence of processing of information granules and contributes to the fundamentals of various disciplines including the recently emerged data science. We strongly believe that the time has come when a journal devoted to this discipline is urgently needed.

Building abstract concepts is of paramount importance to humans when acquiring knowledge, realizing processing (reasoning) and communicating findings. Abstraction comes hand in hand with information granules and information granulation. When perceiving digital photos, we form groups (clusters) of pixels that constitute objects. Our paramount and uncontested ability to form collections of objects (information granules), manipulate them, and produce sound conclusions is realized in an almost subconscious manner. Information granules are critical when

representing and processing knowledge, which becomes instrumental in solving everyday problems.

Undoubtedly, intelligent systems come with various connotations, exhibit different semantics, and imply numerous realizations. In spite of the existing diversity of views and opinions, there are several features that are quite profoundly visible across a broad spectrum of those systems. We anticipate that to a significant extent an intelligent system should be able to effectively communicate with the user, seamlessly accept requests from the human and convey the results in a transparent, meaningful and easy to comprehend format. A user-friendly two-way communication between the human and the system arises as an imperative feature of intelligent systems. Furthermore an intelligent system has to be endowed with substantial learning capabilities where learning can be carried out not only in the presence of numeric data but also in situations when the system is exposed to non-numeric evidence: perceptions, opinions, and judgments. These forms of interaction and learning/adaptation are difficult to realize at the level of plain numbers but have to become carried out at a level of more abstract, carefully structured entities—information granules. There are piles of data everywhere—in engineering, marketing, banking, Internet, insurance, industrial plants, healthcare, and transportation networks. We face the genuine challenge: how to make sense of them, help the user understand what they tell and gather useful evidence to support processes of decision-making. It is apparent that these processes have to lead to constructs that form a useful abstraction of original data. In response to these growing challenges, Granular Computing (GrC) has emerged a decade ago as a unified conceptual and processing framework. Information granules, as encountered in natural language, are *implicit* in their nature. To make them fully operational so that they become

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effectively used in the analysis and design of intelligent systems, we need to make information granules *explicit*. This is possible through a prudent formalization available within the realm of GrC. Among numerous possibilities, offered by GrC, we may refer to sets (interval calculus), fuzzy sets, rough sets, shadowed sets, probabilistic granules, just to name some of well-established alternatives. These alternatives come with their own methodological setup, comprehensive design framework and a large body of knowledge supporting analysis, design, and processing of constructs developed therein.

As a discipline, GrC is still in *statu nascendi* where fundamentals, concepts, design methodologies are very much needed. Our ultimate aim is to build a vibrant research forum to disseminate recent advances in the dynamically expanding area of GrC. We intend to cover a

broad spectrum of subjects of GrC embracing the theory, methodology, and applied side of the discipline including case studies. We envision publication of studies involving fuzzy sets, interval analysis, rough sets, shadowed sets, probabilistic sets yet making sure that they are well positioned in the synergistic framework of Granular Computing and make strong reference to the fundamentals of the area. Several categories of manuscripts are being sought including regular papers, correspondences, reviews and case studies.

We hope that this journal will offer an important platform addressing the needs of the academic community and appeal to practitioners and graduate students by publishing timely and of high caliber papers. We welcome authors to share their exciting research results in *Granular Computing*.