

# Preface

In this book, several contributions to the area of granular computing are presented: a nature-inspired granulating algorithm, various techniques for forming higher-type information granules, and an application comparison of various types of information granules. All research was done with the intention of analyzing the general properties of some core concepts of granular computing, such as the information granulation, the principle of justifiable granularity, and higher-type information granule formation. All information granules were represented via fuzzy sets, either type-1, interval type-2, or general type-2 fuzzy sets. And all proposed approaches are derivative of hybrid intelligent algorithms, such that they automate the modeling from raw data to final fuzzy granular model.

This book is intended as a reference for engineers who wish to dwell into applications of more complex algorithms inspired by granular computing, for aspiring graduate students who desire to better understand how information granules can be formed, or for scientists who want to keep up to date on current research trends on granular computing focused on higher-type information granule formation, or to assess new areas of opportunity where research has yet to be carried out.

In Chap. 1, a short introduction to the book is given, where a broad set of granular computing core concepts are mentioned, as well as a brief description of contributions, applications, and general explanation of the proposed methods is also shown.

In Chap. 2, recommended background and theory is given, where current definitions of many used computational intelligence techniques are shown, as well as a deeper description of granular computing concepts is used throughout the book.

In Chap. 3, the embodiment of all carried out research is placed here from a nature-inspired information granulating technique, to multiple approaches for forming higher-type information granules.

In Chap. 4, a detailed description of carried out experimentation is shown, where each proposed technique results are summarized, giving acute understanding of the performance capabilities of the proposed algorithms.

In Chap. 5, concluding remarks regarding research done is shown with the focus of granular computing concepts and how they help improve the model performance, meaningfulness, and interpretability.

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