

# Foreword

Since Zadeh's Fuzzy Sets Theory was formulated, a lot of efforts have been devoted to extend databases with mechanisms to represent and handle information in a flexible way. The proposals appearing in the literature to deal with this aim are mainly supported in the possibilistic models, similarity relationship models, or the combination of both perspectives. This fact, together with the variety of database models susceptible of extension (i.e., relational model, object oriented models, logic model, object-relational model, etc.), has given rise to many approaches of fuzzy database models.

The materialization of these models in Fuzzy DBMS has not been so fructuous, and the development of applications supported by these systems is in an exploratory stage.

The implementation of Fuzzy DBMS will be determined by the development of applications that take advantage of the capabilities of these ones to operate with flexible information when solving real-life problems. In this sense, different areas of application have appeared, and in this book, some examples are collected, such as data mining, information retrieval, content-based image retrieval, and classical applications in the management field, improved with the possibility of manipulating flexible information (see, for example, <http://idbis.ugr.es/immosoftware> for an online real-estate portal based on flexible search. It is built on the FSQL server developed by José Galindo and other members of the IDBIS group).

One issue that, from my point of view, has not been paid enough attention from the scientific community has been the extension of the conceptual models for the design of databases to the ambit of the representation of incomplete

information. In this sense, this book put together the most important proposals present in the literature. This study is completed with a deep analysis of the features of modeling susceptible of fuzzy treatment to present, next, a fuzzy extension of the EER model, which gives a notation for each of these features. The fuzzy concepts identified in the ambit of modeling require, in a similar way as in the classical case, a DBMS that permits the representation and handling of this type of information. The authors have incorporated these new characteristics to previous models and prototypes of fuzzy databases. The new model, the new data structures, and the new capabilities of handling have given as a result FIRST-2 and a new extension of FSQL (Fuzzy SQL), both of them thoroughly described in this book. The creation of an algorithm that permits the translation of the conceptual definition in terms of FuzzyEER into FSQL sentences completes an important cycle in relation to the conceptual design oriented to fuzzy databases.

Though the central argument of the book is the description of a notation for the conceptual design in an imprecise environment, this volume collects and proposes many worthy resources in the area of fuzzy databases, which makes it an important reference for those people interested in this field in general.

*Dr. Juan Miguel Medina*

*Senior Researcher*

*Member of the IDBIS Group*

*Granada, Spain, January 2005*