

# Deductive<sup>1</sup> and Object-Oriented Databases

Serge Abiteboul  
I.N.R.I.A.,  
78153 Le Chesnay, France,  
Serge.Abiteboul@inria.fr

## Abstract

These notes were written for a tutorial in JICSLP (Washington, 1992) and are not intended to be a comprehensive survey of the field.

We are concerned with *dooD*, i.e. deductive object-oriented databases (systems). We briefly review *ooD* systems (object-oriented database management systems) and *deductive database systems* (the deductive ones). A main purpose is to try to clarify these concepts. As we shall see, although there is already a conference entitled *dooD* and a large body of literature on the topic, the meaning of *dooD* is not yet clear. The issues are not precise and we are still looking forward to the first real implementation of a *dooD* system. We will try to present the motivations, the main achievements so far, and the open questions.

## 1 Introduction

Data intensive applications are nowadays currently written using C and SQL. This is a major source of difficulties since these two languages are based on different paradigms. Furthermore, the user interface is often implemented using specific tools and in particular 4th generation languages and yet different environments. Therefore, application programmers have to deal with tables and tuples at the SQL level, pointers and records at the C level, objects, windows or menus at the interface level. The prime goal of *deductive object-oriented database systems* is to provide a uniform rule-based environment to facilitate the design and maintenance of data intensive applications. The challenge is to improve application programmer's productivity while still guaranteeing reasonable performances. It is not clear that such a goal can be achieved. Also, as we shall see, from a scientific viewpoint, the topic is yet rather ill defined. However, we believe that the research community should participate in the study of these systems: (i) there are indications that such systems will become available and (ii) they raise a number of interesting technical issues.

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<sup>1</sup>A subtlety in the term *dooD* is that the first "D" can be understood as *deductive* or as *declarative*. In this note, we often think of it as *declarative*, or in other words, we use "deductive" in a very liberal sense.

# Deductive And Object Oriented Databases

**Francois Bry,Raghu  
Ramakrishnan,Kotagiri  
Ramamohanarao**

## **Deductive And Object Oriented Databases:**

Deductive and Object-Oriented Databases Stefano Ceri, Katsumi Tanaka, Shalom Tsur, 1993-11-16 This volume contains the proceedings of the Third International Conference on Deductive and Object Oriented Databases Its central tenet is that the object oriented and deductive paradigms for modeling organizing and processing data complement each other rather than competing and that problems involving massive volumes of complex data can best be solved by integrating the best of both approaches Central questions in the area are How do we design a tool that presents the best of the object oriented and declarative ideas How can the users of this tool express their problems in a combination of declarative and procedural features The volume includes 29 papers that contribute towards answering these questions Deductive and Object-Oriented Databases Tok W. Ling, Alberto O. Mendelzon, Laurent Vieille, 1995-11-15 This book constitutes the refereed proceedings of the 4th International Conference on Deductive and Object Oriented Databases DOOD 95 held in Singapore in December 1995 Besides two keynote papers by Stefano Ceri and Michael Kifer the book contains revised full versions of 28 papers selected from a total of 88 submissions The volume gives a highly competent state of the art report on DOOD research and advanced applications The papers are organized in sections on active databases query processing semantic query optimization transaction management authorization implementation and applications **Deductive and Object-oriented Databases** C. Delobel, Michael Kifer, Yoshifumi Masunaga, 1991 This volume is the proceedings of the Second International Conference on Deductive and Object Oriented Databases DOOD During the last decade deductive and object oriented systems have received a great deal of attention but for the most part these two fields were evolving independently of each other Today there is a large body of work suggesting that the deductive and object oriented paradigms complement each other The object oriented paradigm is characterized by its view of the data whereby information is grouped around objects with complex internal structure accessed via methods The declarative paradigm is centered around the idea that data manipulation must be done through a declarative logic based language It is hoped that these two aspects brought together in one system will provide an integrated framework for a new database technology The DOOD conference brings together researchers and developers in the fields of deductive and object oriented databases to stimulate technical discussion and accelerate the integration of the two technologies This volume contains 28 contributed papers selected from 98 submissions and two invited papers by world renowned researchers *Deductive and Object-Oriented Databases* Francois Bry, Raghu Ramakrishnan, Kotagiri Ramamohanarao, 1997-11-12 This book constitutes the refereed proceedings of the 5th International Conference on Deductive and Object Oriented Databases DOOD 97 held in Montreux Switzerland in December 1997 The 22 revised full papers presented in this book were selected from a total of 59 submissions Also included are abstracts or full versions of three invited talks and three tutorials and six short presentations The papers are organized in topical sections on materialized view maintenance extending DBMs features database updates managing change in object databases semantics

of active databases formal semantics and new directions *Deductive and Object-oriented Databases*, 1993 *Deductive and Object-Oriented Databases* W. Kim, J.-M. Nicolas, S. Nishio, 2014-06-28 Deductive databases and object oriented databases are at the forefront of research in next generation intelligent database systems Object oriented programming and design methodologies have great potential promising to reduce the complexity of very large software systems in such domains as computer aided design and manufacturing integrated office information systems and artificial intelligence Object oriented database systems will enhance the programmer user productivity of such systems Research into deductive databases is aimed at discovering efficient schemes to uniformly represent assertions and deductive rules and to respond to highly expressive queries against the knowledge base of assertions and rules This area of research is strongly interacting with Logic Programming which has developed in parallel sharing Logic as a common basis Recently research has aimed at integrating the object oriented paradigm and rule based deduction to provide a single powerful framework for intelligent database systems The aim of this book is to present research papers and technical discussions between researchers concerned with deductive databases object oriented databases and their integration Deductive and Object-Oriented Databases Tok W. Ling, Alberto O. Mendelzon, Laurent Vieille, 2014-01-15 Deductive and Object-Oriented Databases Claude Delobel, Michael Kifer, Yoshifumi Masunaga, 2014-01-15 Deductive and object oriented databases ; 3, 1993

**Deductive and Object Oriented Databases ; 1**, 1989 Deductive and Object-oriented Databases W. Kim, 1990

**How to Derive a New Deductive and Object-oriented Database System from a Well-defined F-logic Database**

Shieh-Loun Lee, 1992 *Towards Integration of Deductive Databases and Object-oriented Databases* Kazumasa Yokota, Shin Sedai Konpyūta Gijutsu Kaihatsu Kikō (Japan), Shōjirō Nishio, 1989 Abstract There have been many proposals for extensions of relational databases It can be considered that two major streams of them are DDBs and OODBs Research on fusion or integration of their advantages has been being done at the forefront of research on database and logic programming For the target the first international conference on deductive and object oriented databases DOOD89 was held in Kyoto In this paper we propose a framework for the extensions along these lines and introduce some research results such as psi term O logic F logic DOT and hierarchical deductive databases in the framework and discuss future directions **Deductive and**

**Object-Oriented Databases** Francois Bry, Raghu Ramakrishnan, Kotagiri Ramamohanarao, 2014-01-15 **LOGIDATA+:** **Deductive Databases with Complex Objects** Paolo Atzeni, 1993-07-29 This book presents a collection of coordinated scientific papers describing the work conducted and the results achieved within the LOGIDATA project a research action funded by the Italian national research council CNR The aim of the LOGIDATA project is the definition of advanced database systems which significantly extend the functionalities of the current systems with specific reference to the application areas for which relational systems are not considered satisfactory These new systems will allow the definition of data with complex structures the representation of semantic relationships between objects and the use of powerful query and update languages

They will be based on a combination of techniques originating from relational databases and logic programming with contributions from object oriented programming. The goal of the LOGIDATA project is the design, definition and prototype implementation of a database management system with complex structures and a class hierarchy to be accessed through a rule based language. This book presents an integrated view of the project at the end of the first phase. The second phase will be mainly concerned with the implementation of prototypes.

**Database and Expert Systems Applications** Gerald Quirchmayr, Erich Schweighofer, Trevor J.M. Bench-Capon, 1998-08-14. This book constitutes the refereed proceedings of the 9th International Conference on Database and Expert Systems Applications DEXA 98 held in Vienna Austria in August 1998. The 81 revised full papers presented were carefully selected from a total of more than 200 submissions. The papers are organized in sections on active databases, object oriented systems, data engineering, information retrieval, workflow and cooperative systems, spatial and temporal aspects, document management, spatial databases, adaptation and view updates, genetic algorithms, cooperative and distributed environments, interaction and communication, transaction advanced applications, temporal aspects, oriented systems, partitioning and fragmentation, database queries, data warehouses, knowledge discovery and data mining, knowledge extraction and knowledge base reduction for comprehension and reuse.

**Deductive Object Oriented Databases Programming and Query Evaluation** Abdulmagid T. Zawia, 2000. **Advances in Databases and Information Systems** Yannis Manolopoulos, Jaroslav Pokorný, Timos Sellis, 2006-09. This book constitutes the refereed proceedings of the 10th East European Conference on Advances in Databases and Information Systems ADBIS 2006. The book presents 29 high quality papers selected in a rigorous reviewing process. The papers address a wide range of hot research issues and are organized in topical sections on XML databases and semantic web, web information systems and middleware, query processing and indexing, modelling and design issues and more. **Advanced Information Systems Engineering** Pericles Loucopoulos, 1992-04-29. As humanity approaches the 3rd millennium the sustainability of our present way of life becomes more and more questionable. New paradigms for the long term coevolution of nature and civilization are urgently needed in order to avoid intolerable and irreversible modifications of our planetary environment. Earth System Analysis is a new scientific enterprise that tries to perceive the earth as a whole, a unique system which is to be analyzed with methods ranging from nonlinear dynamics to macroeconomic modelling. This book, resulting from an international symposium organized by the Potsdam Institute, has 2 aims: first to integrate contributions from leading researchers and scholars from around the world to provide a multifaceted perspective of what Earth System Analysis is all about and second to outline the scope of the scientific challenge and elaborate the general formalism for a well defined transdisciplinary discourse on this most fascinating issue. **Database Systems for Advanced Applications** Jeffrey Xu Yu, Myoung Ho Kim, Rainer Unland, 2011-04-09. This two volume set LNCS 6587 and LNCS 6588 constitutes the refereed proceedings of the 16th International Conference on Database Systems for Advanced Applications DASFAA 2011 held in Saarbrücken Germany in

April 2010 The 53 revised full papers and 12 revised short papers presented together with 2 invited keynote papers 22 demonstration papers 4 industrial papers 8 demo papers and the abstract of 1 panel discussion were carefully reviewed and selected from a total of 225 submissions The topics covered are social network social network and privacy data mining probability and uncertainty stream processing graph XML XML and graph similarity searching and digital preservation spatial queries query processing as well as indexing and high performance

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