Preface

The 1999 Workshop on Spatio-Temporal Database Management, held in Edinburgh, Scotland, September 10–11, 1999, brought together leading researchers and developers in the area of spatio-temporal databases to discuss the state-of-the-art in spatio-temporal research and applications and to understand the new challenges and future research directions in this emerging and rapidly advancing area. The workshop served as a forum for disseminating research and experience in spatio-temporal databases and for maximizing interchange of knowledge among researchers from the established spatial and temporal database communities. The exchange of research ideas and results not only contributes to the academic arena, but also benefits the user and commercial communities.

These proceedings contain the research papers selected for presentation at the workshop. The workshop was conceived from the outset to have a general scope within its area and to be international in participation. The call for papers aimed to attract the highest quality and most up-to-date research contributions from around the world, and the workshop was co-located with VLDB'99, enabling many participants to conveniently attend both events and thereby facilitating the widest possible international participation.

The call for papers attracted 30 research papers, which were submitted by authors from 14 countries and five continents, clearly indicating the truly international nature of the emerging area of spatio-temporal databases. A program committee consisting of 25 researchers from four continents conducted four reviews of each paper and selected 13 outstanding papers for presentation and discussion at the workshop and inclusion in the proceedings.

Spatio-temporal databases manage spatially and temporally referenced data. The papers included in this volume cover diverse aspects of the management of such data, and they have been organized into five groups: understanding and manipulating spatio-temporal data; integration, exchange, and visualization; query processing; index evaluation; and constraints and dependencies.

The first group of papers contribute to the foundations for understanding spatio-temporal data, by offering a taxonomy for the evolving, travel-related behaviors of sets of geographical entities, by giving an algebraic framework for the changes in identities of spatially-referenced objects, and by introducing a model of spatio-temporal partitions.

The second group covers the ontology-based integration of independently produced spatial data sets based on three different notions of semantic similarity among spatial objects; it describes the Italian cadastral information system, which supports the exchange of cadastral data, offers web-based access, and currently has some 15 000 end users; and it provides extensions to VRML that aim at enabling the exploration of spatio-temporal data based on interactive, web-based visualization.

The third and fourth groups of papers are closely related. These papers concern the efficient implementation of operations on spatio-temporal data, and indexing plays a central role in all of them. Efficient techniques for performing nearest-neighbor queries are presented, as is an implementation in the CONCERT system of a generic index for spatio-temporal data. Two papers concern the benchmarking of spatial and spatio-temporal indices. The BASIS system, which supports the benchmarking of spatial indices, is presented, and a performance comparison of three spatio-temporal indices is reported.

The last group of papers is more theoretical in nature and covers dependencies as well as the constraint-based approach to spatio-temporal data management. Specifically, the first paper generalizes temporal dependencies to also apply to other dimensions, including the spatial dimensions and those used in the more general multi-dimensional databases. The remaining two papers concern constraints, providing new insights into the use of so-called indefinite constraint databases for spatio-temporal data management, and exploring the animation of spatio-temporal databases defined in terms of constraints.

Many people played a role in putting together this workshop. The workshop grew out of the European spatio-temporal database project Chorochronos. We would like to thank all the direct and indirect participants in this project for their support. In particular, the project coordinator, Timos Sellis, deserves special thanks for his thoughtful and consistent assistance in the preparation of the workshop. We also thank Christiane Bernard of the European Commission for her support.

Special thanks go to the members of the program committee and the external reviewers they enlisted for their hard and diligent work. As a reflection of their dedication, more than 95% of the reviews arrived on time, with the last few reviews following quickly thereafter. A discussion phase after the initial reviewing aimed to understand and possibly resolve diverging reviews; this phase proceeded effortlessly, with each program committee member taking active part. Giedrius Slivinskas managed the technical aspects of the fully electronic reviewing process with care and dedication; he handled the receiving of submitted papers and their subsequent distribution to the reviewers; and he customized and managed the software for receiving reviews, which was originally developed for EDBT'98 and was kindly provided by Bettina Kemme and Guy Pardon. Michael Böhlen served as the proceedings editor. He managed the interaction with Springer-Verlag and lent his time and expertise to putting together this volume. Alfred Hofmann and Antje Endemann at Springer-Verlag lent us their professional help. Finally, we would like to thank Babis Theodoulidis and his team of workshop organizers at UMIST for their help. We appreciate their efforts in maintaining the workshop's Web page and distributing the call for papers.

September 1999   Christian S. Jensen and Michel Scholl
                                                                        Program Chairs

Organization

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