Preface

Visual Information at the Turn of the Millenium

Visual information dominates the senses we have been given to observe the world around us. We tend to believe information most when it is in visual form. Television and Internet have accelerated the perfusion of visual information to unprecedented heights. Now that all sensors are turning digital, and personal computers and the Net are powerful enough to process visual information, a new era is being born: the age of multimedia information. The dominant component of multimedia information is visual. Hence the conclusion, we are on the threshold of the age of visual information. The approach of the new millenium provokes these sweeping thoughts. Five hundred years after the invention of printed books, visual information has returned to the forefront of information dissemination, on equal par with textual and numerical information.

The practice of designing visual information systems is far removed from such grandiose thoughts. Visual information systems are radically different from conventional information systems. Many novel issues need to be addressed. A visual information system should be capable of providing access to the content of pictures and video. Where symbolic and numerical information are identical in content and form, pictures require a delicate treatment to approach their content. To search and retrieve items on the basis of their pictorial content requires a new, visual or textual way of specifying the query, new indices to order the data, and new ways to establish similarity between the query and the target. A novel element, still lacking research, is the display of the information space of all visual items in the system.

Derived from the Third International Conference on Visual Information Systems, held in Amsterdam, this issue of Springer's Lecture Notes in Computer Science provides a state-of-the-art view on visual information systems. Among the building blocks of visual information systems, the computation of features is currently attracting the most attention. Good features are instrumental in reducing the abundance of information in the picture or in the video to the essence. Ideally speaking the feature is insensitive to irrelevant variations in the data, and sensitive to variations in semantic differences in the data. In the proceedings you will find features of various kinds, where invariance is of specific importance to features for image databases.

For browsing and searching for unspecified items in the information space of all items in the system, visual interaction on the ensemble of all items can provide an overview to the surfing user. In the proceedings you will find contributions on query by iterative optimization of the target, displaying the information space, and other ways to trace semantically similar items or documents. It is expected that the topic will attract more attention, more completely fulfilling the name: visual information systems.

An important issue of visual search is the similarity measure. It is not easy to decide what makes two objects, example and target, experienced as equal. Simi-

larity is currently approached as either an exact correspondence (as in standard databases), as a statistical problem (as in object classification), or as a metrical problem (in feature space). It is quite likely that similarity search as a cognitive problem will gain in weight where human-perceived similarity will be core. Similarity search for all practical purposes is proximity search: the subject and the target match by proximity. In the proceedings you will find many different implementations of the notion of proximity.

Underlying any information system, there should be a database proper with data structures, query specification, and indexing schemes for efficient search. Where the main emphasis of the techniques embodied here is on processing visual information, the connection to databases, and the database parlance is still underrated. In the proceedings you will find contributions on extensions of the database tradition towards unstructured multimedia items, on data structures especially suited for spatial data, and on new ways to access spatial data.

An essential part of visual information processing is the success of capturing the information in the image. Where the biggest problem in computer vision is a successful segmentation step, in image databases several authors find their way around this step. In the proceedings you will find contributions based on characterizing internally similar partitions in the image, salient details, or total image profiles.

Contributions on all these and many more aspects of many more topics can be absorbed from the proceedings. Their combination in one LNCS Volume gives an up-to-date overview of all components of visual information systems.

All the contributions in this book have been reviewed thoroughly. The editors of this book wish to thank the members of the program committee and the additional reviewers for their effort. Their work has enhanced the final submission to this book. You will find their names on a separate sheet. We thank them cordially. With this book we hope that the conference series on visual information systems will continue on to a long-lived future.

The conference chair would like to seize the opportunity to thank the members of the local committee and the conference bureau for making the conference happen. Finally, the support of the members of the visual information systems steering committee has been much appreciated.

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Arnold W.M. Smeulders
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Visual99 Conference Organization

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