

Visual Information Communication

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Editors

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 Springer

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Preface

Visual communication through graphical and sign languages has long been conducted among human beings of different backgrounds and cultures, and in recent decades between human and machine. In today's digital world, visual information is typically encoded with various metaphors commonly used in daily life to facilitate rapid comprehension and easy analysis during the communication process. Visual information communication generally encompasses information visualization, graphical user-interfaces, visual analytics, visual languages and multi-media processing. It has been successfully employed in knowledge discovery, end-user programming, modeling, rapid systems prototyping, education, and design activities by people of many disciplines including architects, artists, children, engineers, and scientists. In addition, visual information is increasingly being used to facilitate human-human communication through the Internet and Web technology, and electronic mobile devices.

This manuscript provides the cutting-edge techniques, approaches and the latest ongoing researches in the context of visual information communication. It is a collection of 24 chapters selected from more than 60 submissions to the VINCI'09 - 2009 Visual Information Communications International Conference, that is held in Sydney Australia, September 2009. These chapters were selected through a stringent review process to ensure their high standard in quality, significance and relevance. Each chapter was reviewed by at least two international Program Committee members of VINCI'09.

The book covers a broad range of contents in five key sub-areas of visual information communication, including.

- 1) The Arts of Visual Layout, Presentation & Exploration: focuses on the design and development of optimized techniques and algorithms for improving the readability of visual objects and structures, in terms of their geometrical layouts, graphical displays and exploration views. Readability can be expressed by means of aesthetic rules, such as the minimization of edge crossings, display of symmetries and optimized design of color and shape schemes.

- 2) The Design of Visual Attributes, Symbols & Languages: visual communication is similar to network and human-to-human communications that need a set of predefined rules (or languages) for information transmissions. In network communication, the talk between network devices is based on a set of communication protocols, such as HTTP and FTP, while the human-to-human communication is based on a variety of languages derived from different cultures. In the design of visual languages for human-machine or human-human communications, we need to address the languages' expressiveness and intuitiveness. The visual languages should be easy to learn and to use; and avoid ambiguity, syntax and semantic errors. This section focus on the above issues in the design of primitive visual properties, such as graphic attributes, symbols and grammars for visual communication.

3) Methods for Visual Analytics & Knowledge Discovery: visual analytics is the integration of interactive visualization with automated analysis techniques to answer a growing range of questions in science, business, and analysis. Visual analytics encompasses topics in computer graphics, interaction, visualization, analytics, perception, and cognition. This section focuses on the proposal of new methods and technologies in this area.

4) Systems, Interfaces and Applications of Visualization: this section focuses on the latest development of new applications, such as advanced tools, software and user interfaces that can be used to facilitate visual communication for a variety of objectives.

5) Methods for Multi-media Data Recognition & Processing: In recent years we have witnessed an increasing role of multi-media data, in the form of still pictures, graphics, 3D models, audio, speech, video or their combination in the real world. This has led to a demand for automatic generation and extraction of both low and high levels of features from multi-source data in order to enhance their potential for computational interpretation, feature detection and processing. This section focuses on the proposal of novel methods that can be used to effectively and efficiently process the multi-media data.

The book offers a systematic presentation of the state of the art in the related fields. With this, the book is very significant and valuable as a reference or a professional book for researchers as well as senior and post-graduate computer science and engineering students.

The manuscript cannot be completed without the helps of many peoples. We would like to thank all the authors for their contribution to the book and their effort in addressing reviewers' and editorial feedback. Thanks also go to the VINCI'09 program committee members and the reviewers for their thorough reviews and constructive comments. Our appreciation also goes to Hung Nguyen, Doan Hoang and organization committee members for their invaluable support. Finally, we would like to thank Susan Lagerstrom-Fife and Jennifer Maurer at Springer USA for their assistance in publishing this manuscript in a timely fashion.

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