

Preface

Over the next 10 to 15 years, all kinds of intellectual resources ranging from science and technology through to everyday information will be expressed using electronic media, and we expect these resources not just to be available for browsing, as with current Web-based publication, but to be redistributed and reedited over networks to form large-scale accumulations at the levels of individuals and societies. Like today's markets brimming with commodities, there will be a flood of intellectual resources in society.

To handle this, we need to change from information organization and access based on rational, logical consideration and inference, as used up to now, to organization and access techniques that make maximum use of human intuitive sensibilities. By intuition humans can instantly grasp holistic ideas, instantly narrow or broaden their focus of attention, instantly change the viewpoint or way of looking at something, and recognize and make judgments about higher-order structures. There are many cases in which the goal of a search can only be stipulated in vague terms, but by repeatedly changing one's viewpoint or focus one can gradually clarify what the required target object is. This too is a feature of intuition-based access. In existing rational, logic-based access methods we have pursued management and search techniques that use categorization and arrangement of target objects on the basis of their attributes. By contrast, we believe that for an intuition-based access method it will become effective to pursue management and search not just by focusing on the objects themselves but also on the process and context of the search that leads to an object. We call the system approach based on this standpoint an 'access architecture.' Organization and access techniques for intellectual resources are intimately related to the design and production of distribution spaces for such resources. In this approach we aim to integrate theories of information design, media structure, and basic knowledge engineering, pursuing access-architecture-based research and development of human interfaces whose presentation and manipulation mechanisms are suited to human intuitive abilities. Hence we aim to research how best to design and organize spaces supporting distribution, exchange and access for intellectual resources, and to establish the fundamental technologies needed for access to the intellectual assets that will flood the society of tomorrow.

To discuss these issues, to exchange about new theories and technologies the series of annual international workshops on *Intuitive Human Interface for Organizing and Accessing Intellectual Assets* was initiated. This volume contains selected papers of the 2004 workshop which was held during March 1–5, 2004 at Dagstuhl Castle, Germany.

To achieve the above goals, research and development are needed in the areas of construction methods for media spaces supporting organization and access activities, the process by which vaguely specified requests are gradually made concrete, design and production methods for media spaces, theories and simulations of intuitive sensibility as well as for mechanisms for augmenting receptivity to information. These lead to the following six research topics on which the workshop focused.

R&D into visual design and construction methods for media spaces

The media spaces that will act as markets for the distribution, organization and access to intellectual resources can define the resources available and the means for making accesses to them. R&D on visual design and construction methods for media spaces will proceed by research into management and search methods focused on the process and context of access.

Intuitive interfaces for data science

To address the rapid accumulation of high-volume data in the domain of science and technology, we will require information visualization techniques aimed at supporting analysis, synthesis and understanding through providing display and manipulation mechanisms that fit the mental models and intuition of the scientists involved.

Research into the information-access formulation process and a system to support it

Based on concept-formulation techniques, we need to investigate techniques for handling access requests specified in vague form, and gradually clarifying such requests during the course of the access process.

Research into design and production of media spaces, and narrative databases

To design and produce distribution spaces with appeal to human intuition, we will need to elucidate the reasoning used since olden times in storytelling, establishing theories regarding the special elements of stories such as archetypal patterns and arbitrary degrees of semantic compressiveness. As well as applying these to the design and production of distribution spaces for intellectual resources, research should be carried out into a 'narrative database' that could be searched using archetypes and summaries.

Theories and simulation of intuition

This theme involves research based on non-monotonic reasoning to provide theories for the intuitive information access mechanisms that allow humans instantaneous grasping of gestalts, narrowing of focus, changing of viewpoint, and recognition and inferences involving higher-order structures.

R&D into mechanisms for augmentation of information reception ability

This is the research into interfaces that will utilize and enhance the information-gathering aspects of the human sensory system.

The papers in this volume cover all these research topics. For the sake of clarity and since some papers deal with more than one topic they are grouped into four categories. Within these categories the papers are ordered alphabetically.

The editors want to thank many people who contributed to the success of the workshop. First of all, we thank the participants for submitting papers, giving talks and discussing till late in the night. The program committee did a good job in reviewing and selecting the papers. Finally, we thank the Dagstuhl crew who (as always) provided a stimulating atmosphere and Springer for making this volume possible.