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Agenda, viewgraphs and minutes of the following Workshop:

**- The CHORUS workshop on "Affect, Appeal, and
Sentiment as Factors Influencing Interaction with Multi Media Information"**
(28th May 2009, Brussels, Belgium)

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Abstract:
The 7th CHORUS workshop on "Affect, Appeal, and Sentiment as Factors Influencing Interaction with Multimedia Information" was held on May 28, 2009, Brussels, immediately following the Third CHORUS Conference, hosted by the European Commission at their Avenue Beaulieu premises. Participation was limited to invited speakers, and comprised sixteen researchers from fourteen research institutes in eight countries.

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INTRODUCTION

The 7th CHORUS workshop on "Affect, Appeal, and Sentiment as Factors Influencing Interaction with Multimedia Information" was held on May 28, 2009, Brussels, immediately following the Third CHORUS Conference, hosted by the European Commission at their Avenue Beaulieu premises. Participation was limited to invited speakers, and comprised sixteen researchers from fourteen research institutes in eight countries (University of Geneva, Switzerland; Folkwang academy and Fraunhofer Institute for Digital Media Technology, Germany; Dublin City University, Ireland; University of Trento, Italy; National Institute of Informatics, Japan; CWI, TU Delft and Netherlands Institute for Sound & Vision, the Netherlands; The Interactive Institute and SICS, Sweden; Teesside University and University of Glasgow, United Kingdom) and from the European Commission. Several large re- search projects were represented, including Chorus (EU), Petamedia (EU), Callas (EU), Info-plosion (Japan), and CC-society (Japan).

WHY STUDY AFFECT, APPEAL, AND SENTIMENT IN INFORMATION ACCESS?

The motivation for the workshop is the recent research interest to include non-topical factors in modelling interaction with information systems. There are several reasons for this raised interest:

- To provide more effective information access mechanisms systems must better model the sentiment and appeal information items hold for their users. This is especially true with respect to multimedia information, where the topicality of the information item may be much less salient for the understanding and use of it than in the case of texts.
- If they wish to provide more sensitive interaction mechanisms and reduce the need for explicit and verbal feedback, systems must better monitor and model the intentions and reactions of their users.
- To provide more useful mechanisms for computer-mediated human communication, for socially aware communication, and personal information management systems.
- To provide a better understanding of human behavior with respect to affect in general and in interaction with computational devices specifically.

APPLICATIONS

One major topic for discussion was that of applications of analysis of affect, appeal, and emotion. An underlying premise was that access to multimedia information items in some ways is much different from access to text and that consequently accessing, organising, and approaching multimedia content must be made from the perspective of the situations where it might best be useful, using notions that capture the usage criteria.

Multimedia information can be found of vastly varying types: information of high quality hitherto stored in comparatively inaccessible archives is being made available across the world in digitisation projects; traditional editorial and professional multimedia production sources are making their materials available over the internet; multimedia information is produced by user outside the traditional professional and editorial sources.

Access to these sources is not similar to the use cases of traditional information access systems. People access multimedia not only through active choices as in a search scenario but also through lean-back interaction where the system must provide more initiative. They access multimedia not only to find topical information for some task, but to find entertainment or diversion, variously for momentary enjoyment or a longer session, in seclusion or in a social context. An important facet of selecting what information to access is that of what others in one's social circle access: building systems to be aware of the social context and communities users participate in will allow users the satisfaction of participating even in the face of a bewildering amount of choice.

Archiving, annotating, and sharing this information appropriately needs more than topical feature extraction - the workshop discussed how to best use affective analysis of user reaction or content analysis of the multimedia material itself to provide appropriate annotations as metadata for a multimedia collection: either through automatic labelling or through providing a basis for information professionals to achieve greater consistency.

The workshop also discussed usage beyond that of prototypical information access: on how emotional models can be used to enhance and carry a dynamic narrative, e.g. in interactive narration and gaming, and how the affective state of user might be useful for interaction with artwork, e.g. as a high-level model for the interaction itself over the interactive session. The discussion in this case touched upon the issue of how much analysis of user a_ect beyond direct observation of user action would be necessary and whether other interaction situations not typically considered to be emotionally charged, such as mundane workplace tasks, might not also benefit from a model of human behaviour sensitive to affective states of its users.

REPRESENTATION

Much of the discussion and the presentations at the workshop addressed the representation of emotion and affective states. Two major approaches are used to model human affective states or emotions:

1. Categorial models where emotions are listed in a palette of salient and recognizable basic emotions as in the \Big 6" or \Big 18" list of emotions, based most notably on work by Paul Ekman and

2. Dimensional representations where emotions are assessed along dimensions such as \Pleasure", \Arousal", and \Dominance", based on work by Albert Mehrabian.

Variants of dimensional models are used by a majority of projects and the discussion achieved a level of consensus in establishing that palette models are less well motivated theoretically for the purposes to which they are applied: the inventory of emotions in the palettes in question are defined to be those which can reliably be identified in still images of facial expressions which yields a palette of emotions less well tailored towards the needs of understanding e.g. information access { many of the research efforts described at the workshop did not attempt to model human affective states directly but the content expressed in e.g. _lm clips through feature analysis of their content.

In the dimensional models used by most projects the dimensions used appear typically not to be independent of each other, but trace patterns or shapes across the representational space. Following such trajectories over the course of e.g. a movie clip over time was noted at the workshop as a potentially useful model for understanding the affective impact of the information item in question.

Several of the research results given used a verbal model as a representation of emotional impact or content of information items. The primacy of verbal categories was only discussed briefly but would seem to be a useful basis for further discussion on representation models: can one assume that words can be used as reliable carriers of emotion, since the emotional impact they occasion must be assumed to vary across users much as the information items they are intended to model also do?

GROUND TRUTH

A further major topic for discussion was how to obtain ground truth for evaluation of analysis schemes, a crucial step for developing applications from laboratory innovation. Some projects made use of self-reporting schemes through interviews, questionnaires, or direct feedback mechanisms; other projects measured physiological reactions or brain scans of users in various situations; many presentations expressed the wish to find unobtrusive and non-invasive methods for assessing affective states of users and of sharing resources in some way.

FUTURE DIRECTIONS

The notion of an emotional or appeal-based search engine was put forth as a potentially worthwhile target for research. This goal would involve several in themselves challenging and potentially quite rewarding steps. Several projects in addition to the ones represented at the workshop currently work on understanding the affective nature of human-computer interaction, on analysing the affective state of the user, or at understanding the opinion or sentiment expressed in information items in collections or information streams. The Networked Electronic Media initiative has in its strategic research agenda goals that conform well to the discussions given at this workshop; the Chorus project has in other workshops and conferences found that the message of affectively enhanced information access systems resonates well with current research projects. Both the Callas project and the Petamedia project address questions discussed in this workshop within their current project plan.

In the discussion at the workshop, purposely, no time was spent to define the various terms for affect, appeal, emotion, sentiment, and attitude. In general, the assumption was that

1. information items or artifacts can carry an expression of sentiment, purposely or implicitly invested into it by its creator and that this expression can be found through appropriate choice of features and appropriate content analysis of the information items in question; that
2. people are in continuously changing affective states of some sort; and that
3. activities they engage in, such as tasks or accessing information items, may have emotional impact and may be informed by the affective state of the user.

For the purposes of information access, the confluence of these factors can provisionally be called appeal, to be used as a target notion for information access systems, much as relevance is operationalised to be the target notion of topical search engines.

The projects and research efforts described at the workshop variously addressed different aspects of these three facets of affect, appeal and emotion. But comparatively few research projects link the study of affective state of the user both with an understanding of the activities they are pursuing and with the study of sentiment expressed in information. This gap is something the workshop noted is essential to bridge for future research efforts.

Secondly, given more information about information items, typical information system tasks such as information retrieval, document categorisation, document recommendation, and computer mediated communication can all, in theory, be improved through a more fine-grained understanding of the potential emotional impact of its content. This is what might constitute an appeal-based search engine, to complement the relevance-based engines in use today. However, the practical question of how to turn these plausible hypotheses into useful and worthwhile systems is in need of a use case analysis, to establish how users might be able to leverage information about potential emotional impact of information items and emotional engagement they require of their users into more useful and effective information access. In some cases, the benefit might be obvious, if, as in examples shown at the workshop, such analysis could be turned into a reliable preference prediction mechanism, (in this case in audio podcasts) or in matching moods across media to achieve cross-media synergies. The importance and the under-utilisation of public media as a communication and information channel was noted by in the discussion: focussing on the private and individual usage scenarios risks missing an entire arena of communication shared across large collectives of people.

Bringing together the most central research questions of content analysis of media, observation of human behaviour, linking the two through an appropriate representation, understanding the potential use cases of affect, appeal and emotion in interaction, establishing the defining characteristics of appeal as a target notion, and bringing them all together in a usefully engineered framework is a grand challenge for the next steps of information access research!

FURTHER DISCUSSION

The consensus of the workshop was to explore the possibility of a further academic open workshop, perhaps in conjunction with the 2010 SIGIR meeting in Geneva. Also, the participants were all encouraged to participate in events organised by the currently active projects in this area.

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