(accepted in the International Conference *Gestures: meaning and use*. Porto, 1 – 6 –Abril, 2000)

# Informing a information discovery tool for using gesture

Keywords: Visualisation, Computer Mediated Systems, Information Discovering, Virtual Reality, Human Computer Interface, Gesture

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## *Abstract*

The paper discusses the use of computer interactive visualisations to develop a system that allows the sharing of a concept space for information discovering. The proposed system presents a 3D interactive visualisation using direct manipulation techniques to support a shared construct based in a structured description of a concept space as an extension of a semantic map.
The system design is briefly presented and lessons learned from prototype development are discussed in order to report requirements that could be used to change the system in order to include gesture recognition as a more natural direction to improve the system, when compared with user embodiment.

## *System goals*

The interactive visualisation system aim is to support user information discovering. The system proposes a tool to deal with the problems of having difficulties to express our information needs to query a data source, construct an useful data access model for a given domain subject and query results analysis. The difficulties are even greater when the data source do not have an underline structure and a query return a vast amount of results.
The system is based on a shared interactive representation of a domain subject that can be used to construct queries and compare a given data source with the domain representation, recurring to 3D visualisation facilities. To allow reuse of each user efforts in information retrieving, a basic support for collaboration is implemented within the system to share the subject domain representation.

## *System description*

The system uses a 3D abstract visualisation based on a structured description of a domain subject based in concepts and weighted keywords grouping – defined here as a concept space. A client/server architecture is used to share the concept space that can be modified by users. In order to support this functionally, a user with proper rights can add new concept and keywords, rating new or existing keywords.
One concept is defined by a number of keywords that characterise it. The exact number of keywords vary for each concept and can be later modified. Each keyword consists of a name to be used for search – composing a query - and an associated weight. The weight can also be later modified by users.
Each client allows an user to interact with the shared visualisation – concept space - and produce a second visualisation from it. The second visualisation supports user organisation of search and browse tactics allowing the creation of a criteria space using the existent concepts. As the criteria space is a 3D space, the user can enter three criteria that serve to determine the spatial position of

each concept based on its keywords rating values. The spatial position for each concept is calculated from comparing the criteria with existing keywords on the concept and using the keyword weight as a co-ordinate value for the criteria. If the criteria do not exist for a particular concept, a co-ordinate value of –1 is given to the concept for the corresponding criteria dimension. This negative value places the concept in a different position within the dimension used to represent the criteria. The resulting criteria space produces a visualisation of eight possible quadrants resulting from the three criteria combination of three dimensions. The criteria space can be integrated with a data source that allow keyword search, using an information visualisation to compare concepts of the criteria space from the first quadrant – the one that contain all the concepts where all the three criteria are represented.

### *Extend the system to support gesture*

An obvious system extension is user representation to complement the shared concept space with information of which users are using the system and where are they in the concept space. This will allow a better support of users interaction for collaborative construction of the concept space by proposing and altering concepts, keywords and ratings. User embodiment allows an awareness of other users, and their activity within the system.

Current systems that use virtual reality technology propose user embodiment, by representing each active user in the virtual space with a dynamic representation that maps user activity within the system. This is more important for systems that use a synchronous collaboration model.

An alternative way for easing the user interface is to integrate gesture has an offer for augmented user involvement. This can be made possible by integrated with each client the necessary means to allow novel ways of interaction. Simple gesture recognition as head movement and simple hands movement could introduce good opportunities to turn the system interaction more natural and this way provide user system awareness. The developed system proposed a concept that uses 3D virtual space in a way that is not easily mapped as a physical space – representing abstract information - where we can place user avatars.

This may lead to an opportunity for using gesture in information retrieving .

### *Concluding remarks*

Why compare these two different kings of improvements: embodiment and gesture? How can both be related? The use of visualisation techniques can improve the interface by supporting familiar cues to the user perception. User representation can also be considered a cue for reality checking, allowing each user confirm how many other users are and perhaps what are they doing in the system. Gesture provides also reality augmentation by offering more natural forms for human interaction by decreasing the effort needed to interact with (and within) the system; in this case, the interactive visualisation becames a manipulation object. The choice for gesture support instead of embodiment is also the choice for a system that do not have intermediaries between the data and people. After all, in reality, we do not see neither ourselves neither we see all the other people when working using their efforts.

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