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COMMUNICATION INSTEAD OF TRAFFIC

Martin Wisy

Abstract. Due to traffic growth in the past two years there are many discussions how to manage resulting problems and environmental pollution. On the one hand traffic is one fundamental basic of our community and on the other side it should be decreased for environmentalism. As the compromise between both parts is not easy to find this paper reflects on possible situations where traffic could be replaced by information transport. Furthermore it postulates some requirements to use future computer communication instead of unnecessary traffic

1. Survey

Mobility is one of the strong advantages in our industrial society. The ability and right of everyone in the society to move from one point to another whenever he needs it, is one necessary prerequisite for growth and social freedom. In the last and actual decade we often talk about the consequence of all those traffic and there are some proposals how to decrease impacts. Most of these discussed suggestions points to decrease necessary traffic by a better traffic management, they try to solve only logistic problems. But often if some proposals succeed, they are overlaid by the stronger growing traffic. Today modern communication technologies like "Multimedia (MM)" and "Virtual Reality (VR)" are able to substitute one (small) reason for traffic. Managers, who are only travelling to meet another partner with the aim to discuss something could use these technologies instead of a journey. They only need to transport the information, not to move the persons. So long, today this is often done by video conferences and similar techniques, but the reason for this paper is a more global idea: This paper postulates some basic points for a "Virtual Conference Room (VCR)". Virtual conference room

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Dr.-Ing. Martin Wisy is with Institute for Computer Science, Ruhr - University, 44721 Bochum, Germany.

means a service provided by telecommunication companies which should give the user the same look and feel he would have if he meets his communication partner in his real office. Such a service would be accepted all the more as it seems like the real life. As a result, we have to postulate at first:

2. The virtual conference room

The service Virtual Conference Room has to act for communication partners as if they sit together in one room. This should be understood more global as a normal teleconference, because the communication partners today look at a video screen in front of them and see and hear the partners like persons in a movie. They realize that they sit in front of the screen and miss the personal aura of the communication partner. Due to our way to recognize environment, what is done by eyes and ears, a Head Mounted Device (HMD) of the virtual reality world should be used. Both (or more) communication partners are sitting in their local offices. Both are observed by video cameras and microphones. The resulting video and audio information must be transferred online to the partner on the opposite end. This information should be presented by the head mounted device. Because the local offices are different and both partners should feel they are sitting in front of them in the same office, it is necessary to cut the persons out of the local office area and put them into the virtual conference room. To do the cut is possible by techniques like blue printing. Fig. 1 gives on overview of the scenario.

Following Fig. 1 and thinking about the video each communication partner receive, it is evident that they get pictures from humans wearing a head mounted device. As those pictures are really not pictures from real persons it is necessary to extract the head mounted device out of the video and replace them by the original part of face. But it is impossible to use previous taken video pictures, because they don't follow the actual play of the features. To follow the postulate one way is to take an additional video from the facial expression (thats why Fig. 1 contains "HMD with built-in camera") and combine it with the video from the whole person. This second video information must be merged onto the person's face which is extracted out of the video taken from the local office.

The above discussed problems point to the structure shown with Fig. 2. The head mounted device should include a video system to follow eye movement and to produce the above explained video. If the head mounted device includes such a video system, there are some additional advantages. In anticipation of the third postulate one of these advantages can be explained as follows: Our human eyes only show a tiny point in a focussed manner.

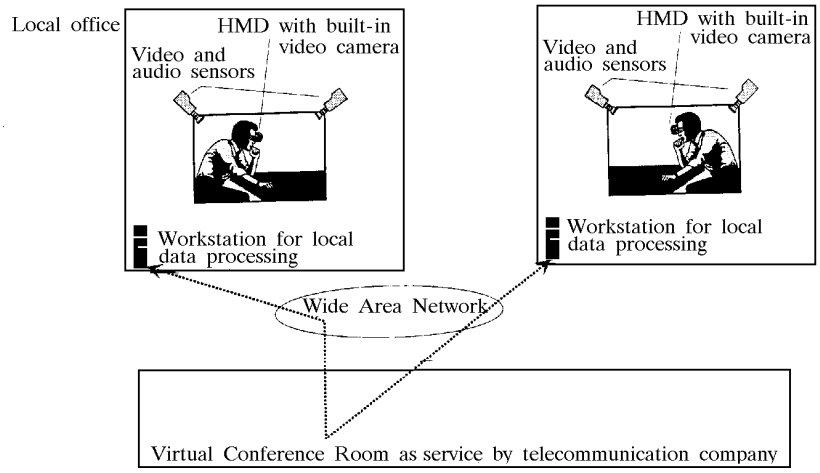

Fig. 1. Scenario of the "Virtual Conference Room"

The rest of the whole picture we see is always unfocussed. If a video system included in the head mounted device recognized the eye movement, it is possible to use these information for computing only the small point in high quality and show the rest of the picture in the head mounted device with less quality. It is obvious that this way decreases necessary computer power and therefore system costs.

It is necessary to remember that all the statements discussed are part of a postulate. To implement such a system it needs more computer power and online data communication capabilities as today are available, but it should be able.

3. The second postulate "Additional Features"

In most cases if two or more persons begin a conference they take seat at a "round table". They can use the table for changing papers and presenting pictures or diagrams to each other. So it is necessary to postulate the round table as the second part of the virtual conference room. Fig. 1 shows that the system is able to design every virtual conference room which is desired, because the virtual conference room parts are defined and presented by software. These software is contained in the service provider system and can be individually designed for each client. So if the conference room needs a round table it is possible to design the round table as part of this room. The conference partners are then merged around the table by the system,

they take place at the table by using software. Remember that they sit in their local office wearing a head mounted device and looking through this device at the table. All additional features needed to solve the usually done conference tasks can be taken from today's telconferencing systems. Perhaps all the known features like diagram sharing, database query and other can be part of the things presented on this table. So, if a communication partner looks up with his eyes, he will see one of the other communication partners like he would realize, if they were sitting at a table in the real world. If he looks down, he will see the actual discussed diagram. This is an additional reason why eye movement had to be recognized by the system.

Now with these two postulates the main requirements for the conference room are named. But there is a third group needed.

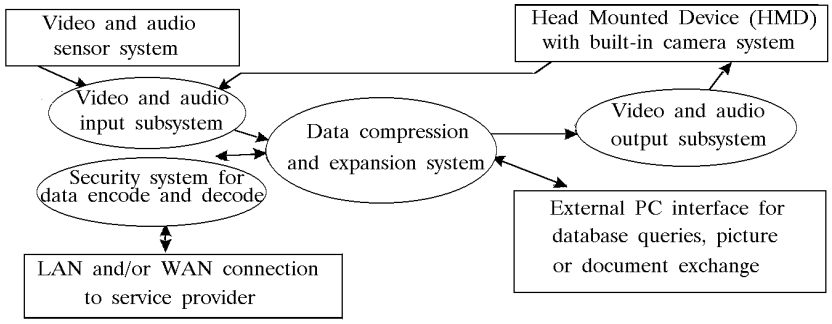

Fig. 2. Structure of necessary components

4. The third postulate "Security"

In the real world it is in most cases easy to decide wether the communication partner is indeed the persons who is intended to sit there. If it is necessary to sign a contract they can do it. But if the partners sit in their local offices and use the virtual conference room, security and signing a contract becomes a new dimension. Therefore it is suggestive to subdivide this third postulate.

At first it is necessary to define a way for identification. This could be done by an electronic identity card.

The next subtopic is the problem with the signature. The signature must be able to be transmitted in a juristical clear way.

Another group is given by data transfer pass. There are more things than one which should be discussed. It is obvious that data integrity is a

great point. Furtheron nobody has to listen and at all to understand the data transferred. Therefore it is necessary to encode datagrams before they are transported. It is possible to take two key concepts or other useful algorithms. The actual discussion around the problem of crime and the abilities of encoded messages in computer networks is a difficult exercise for the designer of such a system. He has to weigh a well closed system against the necessary control option for the government.

These three postulates build the design parameters for such a systems. But there are additional aspects which should be considered. Introducing the virtual conference room for other enterprises than great industrial companies will only succeed, if the costs for such a service are acceptable. Small and middle great companies like special software offices and similar enterprises are possible clients for using the service. Another point for success is the implemented compromise between the postulates above and the created service. Following the rules exactly will produce a system which needs high speed data communication networks as transport medium for the datagrams. So the designer has to find a compromise between created data volume on one hand and the implemented features on the other hand. Therefore it is a good idea to use data compression methods to minimize datagram size and maximize service functionality.

5. Summary

The problem discussed in this paper points to systems which will be implemented in near and middle future. It is obvious that these things could be done, even if not from a small institute but by a big telecommunication company. Only they have the needed man power.

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