CENG 491 – 492, COMPUTER ENGINEERING DESIGN I – II

PROJECT PROPOSAL

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TOPIC OF THE PROJECT:

As you all know paper posters are very common in daily life because of the fact that they are inexpensive and easy to install. However, they lead to some disadvantages as well. Most important of all, they do not provide the opportunity to make a change in the content of the poster once it is installed. In addition, it is possible for a person to forget about the details of the event unless the information is noted. Besides, it is not easy to inform other people about the event when paper posters are used. Furthermore, paper posters are easy to damage. To illustrate, when a person rips the poster, the information is lost and it is costly to bring it back.

We believe that all these undesirable facts will come to an end by means of the "DIGIPOST PROJECT" that we will develop. With the help of this project, it will be much easier to update the content of a poster since it will be a computer based image which can be uploaded with just a few clicks. Since the details of an event will be sent to a device via interactive bluetooth, the information can be stored until the owner of the device deletes the message. In addition, s/he will be able to send the message to other people easily using bluetooth technology. It is obvious that the disadvantage about ripping the posters will be prevented with the help of DIGIPOST.

Now let us give some technical details about the project. We will design and implement the hardware and software required to make an LCD monitor or television into a digital poster with bluetooth capabilities. Our system will be connected to a bluetooth converter card and a monitor

via VGA or Composite video. We will develop the necessary software for administrative tasks like uploading poster images and event data. Users will be able to see the still poster image on the monitor and follow a procedure on their Bluetooth devices in order to get poster event data as a calendar event (iCal VEVENT).

POSSIBLE APPLICATION AREAS:

The project that we will develop may easily be used in places where all kinds of social and cultural activities are held including cinemas, concerts, theaters etc. Also, this project can be used for educational purposes. As an illustration, there are a lot of student clubs that give seminars and meetings. With the help of our project, it will be much easier for the sudents to become aware of these activities and share the information with each other. The project will also be used for commercial purposes. For example, when there is a campaign in some product, the comsumers will easily be informed about it. We believe that as the project evolves, it will be much more wildly used in different areas.

INITIAL IDEAS & FEATURES TO BE DEVELOPED:

To begin with, we did some research about the topic of our project and we found out that someone previously made a black&white video using pic. We believe that the first thing to do in our project is to try to understand his project so that we can develop ours which is based on rendering colored images to an LCD.

As a result of our research, we realized that the input specification of LCD monitor and TV. So we decided to make a deeper investigation to choose one of them for our project. In order to do this, we are planning to consult some of our assistants who are interested in embedded systems applications.

We also realized that our project consists of 3 basic parts:

1- forming a movie on LCD/TV screen,

2- integrating bluetooth part into PIC,

3- sending message to the other bluetooth receivers.

Creating a video signal on the screen is the hardest part of our project. For achieving this, we should obtain synchronization through our code. We know that video image is sent as frames to the screen and transformation of every frame line should be done in equal time slices. For achieving an active video on LCD, we should first solve the problem of resolution. Increasing resolution is necessary for active movies. With this aim, we should give great importance to the

coding part of the project. As we said before, every line should be transformed in a specified time period and saturation is identified according to the number of pixels that we show during this period. In other words, only x- axis of the screen has effect on saturation and we should maximize the pixels in the x- axis for obtaining an action movie.

After our search we saw that sending the image frames as odd and even lines is one of the tricks for decreasing flickering. We believe that for a qualified image we will need this strategy.

No colorful movies have been created on PIC yet. Because of the limited RAM on PIC, the information about more than two colors cannot be identified in the process of coding. However with the help of our assistants and a more detailed research about the subject, we think that we may overcome this challenge too.

For the bluetooth part of our project, we realized that we should first deal with the integration of bluetooth device into PIC. After this integration, we will send information in packages in endian format. Transformation of message will be done from master (PIC) to slaves (telephones with bluetooth capability) by sharing the same channel.

Bluetooth mechanism uses host controller interface (HIC) for basic commands like sending data, receiving data etc. We think that, we should create our modified HIC for providing bluetooth with the necessary hardware structure.

Finally, we will make a questionnaire in which we will ask the people around us questions about the usage of our project in order to develop our ideas about it. We think that this step is very important in our design since it will increase the user-friendliness of our project.