

A DEVELOPMENT OF A REMOTE SENSING EDUCATIONAL PACKAGE

Sultan AlSultan[#], ABDULAZIZ O. ALTWAIJRI*, H. S. Lim**, Badaruddin Mohamed***,
M B. Z. MatJafr**,i, K. Abdullah** and N. Mohd. Saleh**

[#]senior adviser to Ministry of Higher Education, Ministry of Higher Education Riyadh 11153, Saudi Arabia,
Ass. Prof. of Remote Sensing at Qassim University, Tel:+96663800050 - Mobile: + 966 50 489 0977
ISPRS, Commission 7.7& 6.3, Middle East Coordinator, <http://www.commission7.isprs.org/wg7/>,
<http://www.itc.nl/isprsc6/wg3/>
Email: - computer_305@yahoo.com

*Director General of The Islamic Educational, Scientific and Cultural Organization (ISESCO)
Avenue des F.A.R , Hay Ryad, PO Box 2275, PC Code 10104 Rabat - Kingdom of Morocco
Telephone : + 212 (0) 37 56 60 52 / 53, Fax : + 212 (0) 37 56 60 12 / 13
- isesco@unesco.org.ma

***School of Housing, Building & Planning, University Saints Malaysia
11900 Penang, Malaysia, Tel. + 60194431894, fax: +604-6564067, bada@usm.my

**School of physics, University Saints Malaysia, 11800 Penang, Malaysia. Tel: +604-6577888, Fax: +604-6579150
E-mail: - hslim@usm.my, mjafr@usm.my, khirudd@usm.my, nasirun@usm.my

ABSTRACT:

Advances in information and communication technologies (ICT) have provided the tools and the environment to study, analyze, and better understand of the remote sensing applications. Computer Aided Instruction (CAI) is an application of computer in implementing instructions. In this study, a multimedia remote sensing education package was developed using Macromedia Flash software. The objective of this study was to create a CAI package entitled remote sensing processing and to developed of international cooperation and capacity building on remote sensing education collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). This CAI package is very useful to those who are interested to continue their studies or research in the fields of remote sensing. The project involves two components. This is a collaboration project between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). As the conclusion, this CAI package can play an important role as an alternative material to all the interested users to use this CAI to explore remote sensing processing and technique.

KEY WORDS: Remote Sensing, Environment, Mapping, Land, Application

1. INTRODUCTION

CAI programs that are actually being used in schools vary from courses on micro-electronics to simulations of photosynthesis. Computer-aided instruction packages are effective for many reasons. One of the most important reasons is that students like learning in the ICT environment. CAI packages of today are much more user-friendly and entertaining than their predecessors. "These technologies move us light years beyond the tedious drill that early educational software promoted, and allow highly engaging activities like multimedia simulation. Students can now work at their own pace regardless of the level at which they are supposed to be. This promotes self-confidence because it gives the student a feeling of control over what they are learning. The computer has allowed the student to become a more active participant in his/her education. In order for CAI to be an effective classroom tool, certain criteria must be met. All of the software in the world cannot help if the teacher is not prepared to learn how to use it.

This CAI package is an interaction media which plays an important role as a teacher. Audience can obtain the message and information in dynamic form through CAI package. CAI package will be present in various computer interfaces either in two or three dimension. CAI package also present visually exciting graphic and animation displays. The main objective of this study is to introduce a fundamental of this digital image and

a few common methods to process a digital image which have a very wide range of application in our modern world.

Computer programs are interactive and can illustrate a concept through attractive animation, sound, and demonstration. They allow students to progress at their own pace and work individually or in a group. Computers provide immediate feedback, letting students know whether their answer is correct. If the answer is not correct, the program shows the correct answer for the question (The Access Center).

Reading computer programs demonstrate concepts, instruct, and remediate student errors and misunderstandings from preschool through college. Some programs help students learn basic sight word and phonics skills; others develop and enhance reading comprehension skills through increased fluency, word prediction, and story prediction. Programs may use reading activities as a community service project or as competition among students to read books (The Access Center).

The aim of this project is to investigate the current state-of-the-art in computer-aided instruction (CAI) and develop an interactive CAI tool/package for remote sensing education collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). In this project, our packages were developed on the Microsoft Window

platform. For this study, a personal computer with Intel Pentium 4 Processor with Hyper-Threading technology - 3.0GHz, Microsoft Window XP in the Engineering Dr. Sultan AISultan develop his idea and methodology with help of Laboratory, School of Physics, and School of Housing, Building & Planning, University Saints Malaysia, was used. The software we used for generating CAI package was Macromedia Flash and supported by some other computer software like Adobe Photoshop and Sound Forge. Adobe Photo was used for graphic and picture editing and Sound Forge was used for sound editing.

2. DEVELOPMENT OF INTERNATIONAL COOPERATION AND CAPACITY BUILDING BETWEEN ISPRS COMMISSION VI WG3 MIDDLE EAST, QU, USM AND ISESCO IN REMOTE SENSING EDUCATION

This project involves two components of remote sensing processing and to develop of international cooperation and capacity building on remote sensing education collaboration between Staff from the College of Computer Sciences & Information Technology, Lassie University in Saudi Arabia, ISPRS Commission VI WG3 Middle East, The Islamic Educational, Scientific and Cultural Organization (ISESCO), in association with the School of Physics, University Saints Malaysia. are completing a pilot collaboration project on remote sensing applications since 2002 untail now. In this project, focus had been made on the remote sensing project:

1. Land surface temperature
2. Land cover / Land use mapping
3. Changes detection
4. Air quality mapping
5. Land surface temperature and urban heat island.
6. Hajj Research 2006

Research collaboration between and QU AlQassim University and USM has been established and many research articles have been published either in journals or conference proceedings such as:

1. Estimation of seasonal agricultural vegetation coverage for two seasons over Lassie, Saudi Arabia
2. Environmental impact assessment and evaluation of the land cover features from Landsat TM and SPOT over Makkah Almukaramah in Hajj Season
3. Land surface temperature estimation over Palestine and Mediterranean.

4. Urban heat island evaluation over Makkah and Madinah by remote sensing.
5. Area estimation from Landsat TM data over Makkah.

3. METHODOLOGY

Firstly, the computer must be installed with the Macromedia Flash MX software. To begin, open Macromedia Flash MX. The screen shown below here will be presented (Figure 1).

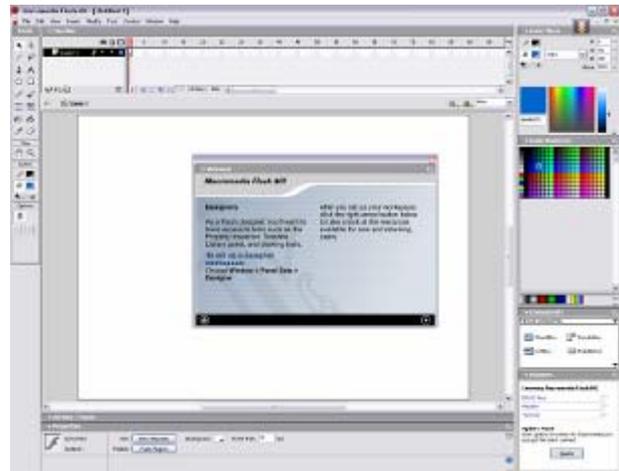


Figure 1. Main screen of Macromedia Flash MX.

To create a new document, click Flash Document. The screen shown here appears (Figure 2):

The upper left corner of the screen displays the Tools palette, which contains tools to create or modify graphics and text. We can select a tool by clicking on it. Tool modifiers for the selected tool display below the Tools palette. We use modifiers to set tool options. The Timeline appears in the upper portion of the screen. We use the Timeline to lay out the sequence of your movie. The Stage displays in the center of the screen. We create our movie on the Stage. We set these properties in the Movie Properties dialog box. To set the properties for the movie:

1. Choose *Modify > Document* from the menu. The Document Properties dialog box opens (Figure 3).



Figure 2. New document in the Macromedia Flash MX.

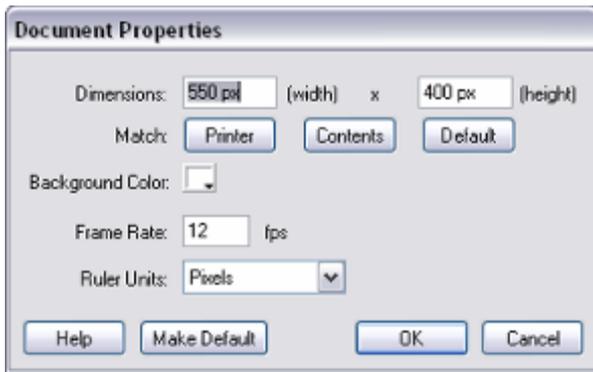


Figure 3. The document properties dialog box.

In the Macromedia Flash MX, the entire cast members that we want to use have to be imported into Library. The timeline or the scope for the Macromedia Flash MX was formed from the layer as a location for the sprite cast member. The length of the CAI package can change with the frame on the layer in the timeline function. If your timeline window is not open, press (Ctrl+Alt+T). Select the first frame. Import the picture or change a subject onto stage, upon which you would want to implement motion Tween. Now select your object on the stage and press F8 to convert this image to a Symbol. Convert to Symbol window will pop-up. Name your Symbol what ever you like. Select Graphic behavior and press OK. Right now your Symbol is in frame1 of Layer1 (Figure 4). Select frame 20 and press F8 to insert a new keyframe.



Figure 4. Layer of Macromedia Flash MX.

Besides that, we can change the effect for the picture. Such as we can click the button of modify – Transform – Scale – Rotate to rotate our picture. In this case, we just need to identify the scale and the rotate degree.

We also can insert an image, convert it to a button, and add a URL to it so it becomes a link. First, we need to import an image that will become a button. We also can create our own symbol as our button using Macromedia Flash MX. The image will be saved in the Library. Second select the image with the Arrow tool and convert the image to a symbol. Next we need to right click on the image and choose Actions from the pop-up menu. Then enter a full URL in the URL field and choose the target in the Window field that want to link.

We also can insert sound into our CAI package. We just need to import a sound file into our CAI package. Finally, we just click on Controls and play or just press **Ctrl+Enter** to view our animation. We also can embed this CAI package in HTML pages by using Macromedia Flash MX.

4. CAI PACKAGE

Currently, a lot of animation software that can be used to generate a media interaction in animation format like Macromedia Flash and Macromedia Director in the market. Macromedia Flash was a powerful tool to produce animation. All the information presented by this CAI package was the basic

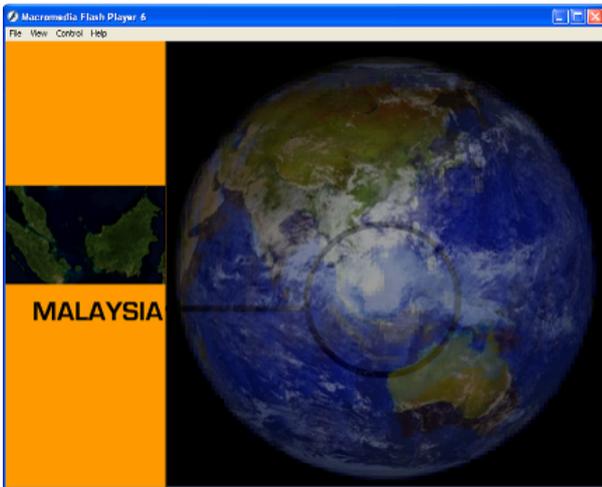
theoretical of remote sensing and some information on the research articles carried out between .

The first goal was to identify the various methods used for the research collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). in this CAI package. In this CAI package, Adobe Photoshop and Sound Forge softwares were used to associate the main animation software of Macromedia Flash. The professional image-editing standard software of Adobe Photoshop was used for picture and graphic editing. All the graphics presentation in animation format used the Macromedia Flash. Finally, all the sound effects were edited using the Forge software. Figures 5 to 12 show some of the graphic frames from this CAI package.

This CAI package can be used by all levels of personnel. It can be used as a tool for providing useful information on the collaboration remote sensing project between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). and also as an object of the study itself. GIS, image processing and other related software have become indispensable tools for scientists.



Figure 5. Research between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO) in this CAI package.



(a)



(b)

Figure 6. The location of Malaysia (a) and Saudi Arabia (b).



Figure 7. The research collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO).

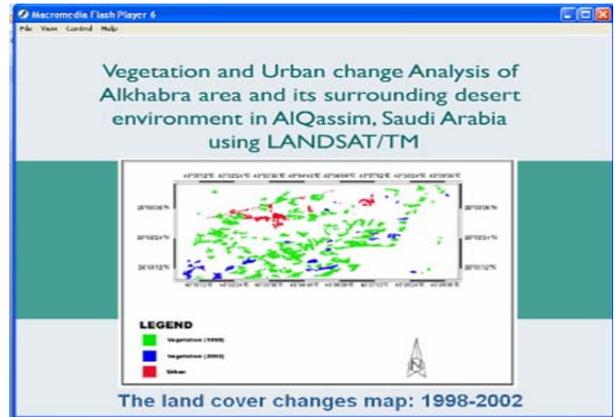


Figure 8. The land cover change produced by the research collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO).



Figure 9. The heritage of Alkhbra Desert City (photo by Badaruddin Mohamed)

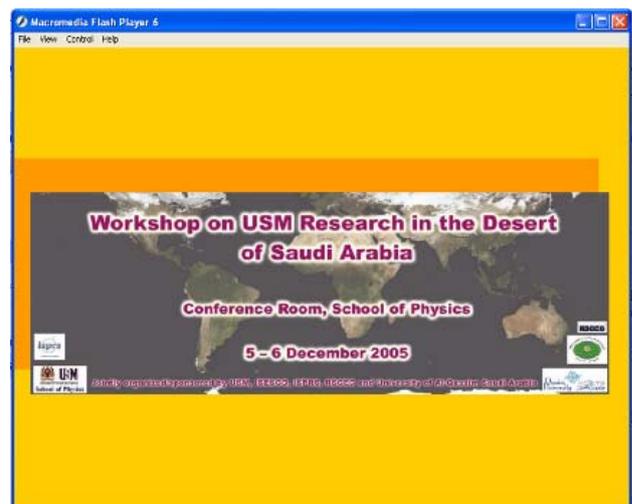


Figure 10. ISESCO, AQ, USM, ISPRS Workshop research in the desert of Saudi Arabia.



Figure 11. ISESCO, AQ, USM, ISPRS research in the desert of Saudi Arabia – Hajj Research.



Figure 12. ISESCO, AQ, USM, ISPRS research in the desert of Saudi Arabia – Dr. Sultan Al Sultan, team leader (Hajj Research 2006).



Figure 13. ISESCO, AQ, USM, ISPRS research in the desert of Saudi Arabia – Conference Presentation at Technical Commission VI Symposium, Tokyo, Japan, June, 27-30, 2006 (Hajj Research 2006).

5. CONCLUSION

This CAI package helps readers understand the basic principles of remote sensing and the research activities carried out by ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO), in animation format. This CAI package can increase the student interest in the subject through the use of interactive materials and provides information of the research collaboration between ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). During the next phase, improvements and modifications of this CAI package will be made to ensure that the materials are suitable for all level of the users.

ACKNOWLEDGEMENTS

This project was carried out using Dr. Sultan AlSultan grants since 2003, 2004 and ISESCO grants 2005, Dr. Sultan AlSultan & QA, ISESCO grants in 2006-2007. We would like to thank the technical staff who participated in this project. Thanks are extended to ISPRS Commission VI WG3 Middle East, Lassie University (QU) in Saudi Arabia, University Saints Malaysia (USM) in Malaysia, and The Islamic Educational, Scientific and Cultural Organization (ISESCO). for support and encouragement.

REFERENCES

Jensen, J. R., 2006, *Remote Sensing of the Environment: An Earth Resource Perspective*, 2nd Ed., and Upper Saddle River, NJ: Prentice Hall. Available Online, <http://www.cas.sc.edu/geog/Rsbook/Lectures/Rse/index.html>.

The Access Center, Computer-Assisted Instruction and Mathematics, http://www.k8accesscenter.org/training_resources/computeraided_math.asp

