

iTeach - Interactive Teaching and Learning

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1. ABSTRACT

In this paper, we describe a system to support the effective learning of multimedia and communication technology. The main parts to be shown are the hyperbook, in which a user is guided by an automatic tutor in the background and the applet-toolkit which allows for experimenting with and combining various applets visualizing the topics to be learned.

1.1 Keywords

Multimedia Learning, Tutorial Systems

2. Introduction

In the past a lot of electronic teaching material including electronic books, intelligent tutorial systems and web-based courses emerged. Most of these also commercially available products use a variety of different media such as video, audio, images, animations and hypertext to exploit the nature of hypermedia at its best to yield some sort of optimal learning success. However, these systems often have some major drawbacks, such as:

- *Wrong scope.* The integration of a vast amount of animations, sounds and videos does not necessarily yield better results.
- *Video-like nature.* Most of the animations being used to visualize complex algorithms and techniques cannot be influenced by the user. He/She can watch the ongoing animation and try to understand the underlying theory.
- *Bad user-support.* Most systems use the following approaches: either there is no didactic component and the user has to find topics he is interested in without any support, or there is just one theory of learning being supported (e.g., cognitive learning). It would be much better if the user would be enabled to choose among different styles to adopt the one he likes best.

Many other disadvantages could be identified. It therefore is the goal of the iTeach-project of the University of Darmstadt to create a system with an optimal support for the learner,

integrating a variety of different learning styles. In this demonstration we will show the overall system as well as the applet-toolkit which allows for experimental learning styles.

3. iTeach-System

The iTeach-System is based on a user profile which guides the user by tracking the actions he is performing when reading the electronic book. First, he/she has to put in his/her general preferences to be able to suggest an appropriate learning-style. The individual chapters of the book are generated on the fly on the basis of the style which has been chosen. Using an explorative style, the user first has to learn a specific subject by using an applet which is not of a static nature in a sense that parameters can be modified and components can be exchanged.

4. Applet-Toolkit

A major component is the *applet toolkit* which is based on a component architecture. Using the JPEG-toolkit, the user can modify e.g. DCT to FFT, exchange different modules of entropy encoding and observe the different results in terms of compression factors and image quality. All applets have a hierarchical nature allowing for a switching to more detailed levels.

5. Demonstration

The demonstration consists of three different parts:

1. the iTeach-system.
2. the iTeach-applet-toolkit
3. metainformation to explain the processes generating the material according to selected learning strategies.

