

Interactive E-Learning for Digital Image Processing

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Abstract: E-learning is a neoteric and intuitive way of education. It is one of the most commodious technologies, which is based on the internet. Due to advancements in technology, people now a day aspire to gain knowledge at their own pace and in their own time. E-learning provides a global platform for the collaboration of such educators and knowledge seekers. This system has been developed to learn and understand some basic concepts of Digital Image Processing through an interactive website. Digital Image Processing is an approach of applying different techniques, protocols and algorithms to transform and enhance the image. Digital Image Processing is a technique which can be best understood when visualised. The main objective of this system is to perceive the concepts of Digital Image Processing in a preferable way. This system has been built by using various front-end and back-end technologies as well as database.

Keywords: E-Learning, Digital Image Processing, Website, Front-end technology, Back-end technology, Database

I. INTRODUCTION

Interactive e-learning for Digital Image Processing is a technique which can be widely used to study, understand and visualize the concepts of Digital Image Processing. However, the traditional learning methods using books now seems dull and unexciting. This project proposes a technique wherein a website can be used by knowledge enthusiasts to learn Digital Image Processing in an alluring way. It is cost effective compared to traditional learning [1].

II. LITERATURE SURVEY

Dr.P.Nagarajan and Dr.G.Wiselin Jiji [1] proposed that the sinuous edifice of online educational system consist of three ethics which are Design, Implementation and proper Post Implementation Assessment. The knowledge and experience in those facets are lacking. For productive execution of these three pursuits, the requirement of design and educational models are necessary to gain the time and cost efficiency along with improved academic quality. They implemented a universal formulation of models and also a framework for finding patterns which improves online educational system for both knowledge seekers and givers which brings effective evaluation of learning process. Nguyen Huu Phuoc Dai, Duong Van Thinh, Rajnai Zoltán [2] proposed that e-learning is an impactful method of learning which supersedes the traditional learning method. Their survey results of

the students' response towards e-learning showed that Vietnamese students were pleased with e-learning method. Also in their research they recognised that Vietnamese students needed e-learning for their full-time training courses and also for their part-time courses.

III. IMPLEMENTATION

The proposed system revolves around a 4 layered hierarchical structure.

1. User – Here, a user is a knowledge seeker who desires to learn Digital Image Processing with the help of the website. The user will be identified by the system with user's user name and password.
2. Client-side Interface (Web Browser) – In this system, the web browser is simply a platform provided for the user to retrieve the required information.
3. Server-side Processor – It is the link between the user and data source. It passes on the results of the requested information by the user, to the web browser which is ultimately displayed to the user.
4. Data Source – It is simply the source of the data. Here it is a database on a Database Management System.

Implementation steps:

The implementation steps are shown in 'Fig 1'. It shows the User Interface (UI) process that takes place within a website. The steps can be summarised as explained below.

- A) *User defines a query.*
User will login to the website using their username and password and will request for access of required information.
- B) *Query is sent.*
User's Query is passed on to the Server-side agent by the web browser.
- C) *Response of server-side agent.*
Server-side agent processes the Query and asks the Data Source for the required information.
- D) *Data Source returns Query results*
In response to the Server-side agent's Query, Data Source will forward the required results.
- E) *Server-side agent returns Query results.*
The results are eventually displayed to the user on the web-browser.

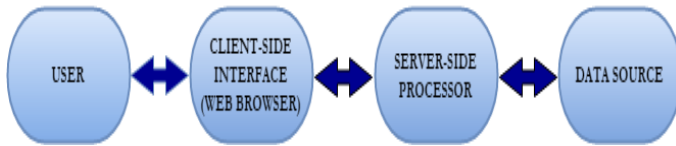


Fig 1: UI Process

IV. METHODOLOGY

A. HTML5

HTML is a mark-up language used for building web pages and web applications.

B. JAVA SCRIPT

Used to provide interactivity to website

C. CASCADING STYLE SHEET

It is a simple methodology for adding style like fonts, colours, spacing etc. to Web documents.

D. STRUCTURED QUERY LANGUAGE

Structured query language is a domain specific language which is used to send queries to database and access it.

E. MySQL

It is an open source relational database management system. It is reliable, fast and easy to use and uses standard SQL.

F. JAVA TECHNOLOGY

A Common Gateway Interface (CGI) and basic-level server API programming such as NSAPI (Netscape) and ISAPI (Microsoft) is also known as servlets or server-side applets.

V. EXPECTED RESULTS

In this project, a website will be developed for learning digital image processing. It will include various modules and will contain quizzes for each module to test if the concepts are cleared. It will also contain online MATLAB compiler to compile MATLAB codes for digital image processing online. Interactivity to learn concepts will be included.

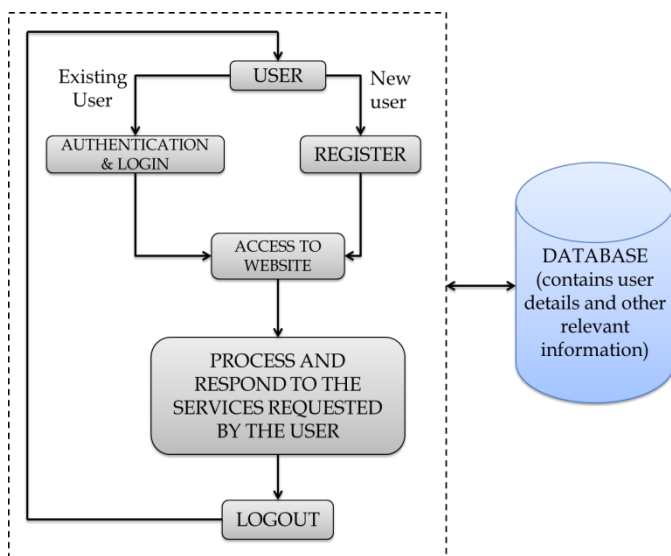


Fig 2: Flow chart of the expected result

The expected flow of the process in the website is shown in the 'Fig 2'.

VI. CONCLUSION

Interactive e-Learning for Digital Image Processing is a solution to restraint the various inconveniences in the traditional learning approach. This project has employed various technologies and their optimisations to achieve this goal. Learners can also test their knowledge by attempting the tests and quizzes provided in the website. Through this project, the aim is to make studying Digital Image Processing respite and easy to perceive.

VII. FUTURE SCOPE

1. Video Sessions – Learning can be made more comprehensible by including various video sessions by educators all over the world.
2. Android Application – The system can be developed on an android platform where instant push notifications can be given.
3. Online Certified Courses - Studying for a certification raises the conceptual understanding of the technology.
4. Live Tutorial Sessions – Introducing live tutorials would help in quick responses for learners' doubts regarding the subject.

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