Smart Lecture Recording and Broadcasting System

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Abstract

The way in which knowledge transfer takes place in a traditional class room-based lecture can, however, be considered highly inefficient. The rapid evolution of communication technologies, advanced data networks and semi automation of multimedia information processing have greatly impacted learning Towards Automated Lecture Capture, Navigation and Delivery System experiences The use of course web pages ,discussion groups, bulletin boards, and e-mails have shown considerable impact ton teaching and learning in significant ways, across all disciplines. E-Learning has emerged as an alternative to traditional classroom-based education and training and web lectures can be a powerful addition to traditional lectures. A web lecture consists of video and audio of the presenter and slides complemented with screen capturing. In this paper, we have presented smart lecture recording and broadcasting system. Web-based learning methodologies are becoming increasingly popular in education, and have been shown to be comparable to text-based learning in knowledge gains, are enjoyed by students and may be more time-efficient than other methods.

Keywords: Lecture recording , Streaming , Detection , Web lectures

Introduction

The lecture method is the most commonly used teaching method in higher education and is often translated for use in distance education using a variety of technologies. One technological approach that has emerged recently and is receiving growing attention from higher education institutions is audio and video streaming. However the value of the traditional lecture method continues to be a subject of debate, and so higher education institutions wishing to use streaming technologies to deliver lectures

need to research the advantages and disadvantages. Past research has shown that relationships exist between teaching styles, learning styles and success in higher education [4].

Some academic or commercial institutions conduct the lecture with the aim of carrying on the education with less cost, the propaganda or the communication[2].To assist these audiences in receiving information without the limitation of time and places, we will record the lectures and broadcasts in the network.Such recording will have the following works: First, we need to explore the lecture room to decide the camera setting. Second, a cameraman operates a camera to make a recording. Third, a post-production is designed. However, recording a lecture is really expensive. It would include of the fixed and labour cost. In fixed costs, we may require computer server, microphone, camera, and etc. Fortunately, fixed cost is only paid in construction. Labour costs, such as the payments for equipment, operating cameras, and post-production, may need to pay for each lecture recording. Since labour cost is required every time, many researches focus on automatic recording systems in order to reduce the cost. We propose an automatic lecture recording system. In this system, we use a camera shooting in a lecture. Only image information is considered right here. The lecturer and the screen are the main information captured in our system. The idea is captured from [1] and [3].

Demerits of Traditional Classroom Coaching

The term "traditional classroom" brings to mind visions of a classroom of twenty or more children, all roughly the same age, listening raptly to the instructor or teacher, while all working diligently at their studies. The reality is far different. In a traditional classroom environment, there are usually anywhere from twenty to thirty children and one teacher. In some cases, that teacher might have a "teacher's aid" or an assistant teacher. This is where the disadvantage starts- it is simply impossible for one person to give each student the one-on one attention or instruction that may be required. In a classroom of twenty to thirty children, there are going to be several children with differing learning styles and academic strengths and weaknesses. A teacher and/or teacher's aid is going to be woefully unequipped to handle any and all learning styles or weaknesses. And woe to the teacher who has a couple of students who present themselves as "problem students," a child who is difficult to manage or who disrupts the classroom is also going to take away time that the teacher could be using to help with one-on-one time with his or her students. Which brings to light the next disadvantage of a traditional classroom? In a traditional classroom environment, it's not uncommon for children to become bored or frustrated. Some children learn better by visual means, others will learn better with auditory means, and still others are going to learn better with a hands-on approach. It is virtually impossible for a single teacher to accommodate all methods of learning when he or she is responsible for teaching a large number of children. Thus, children who do not fall into the "traditional learning method" category are far more likely to "fall through the cracks," become bored or discouraged, or to display behaviour problems in the classroom[4].

Proposed System

In this project, we propose an intelligent lecture recording & broadcasting system that will automatically filter out the projector screen and the presenter face if it appears in front of the screen. Optimal video with changed images will be distributed to all the students through online streaming. Most of the lectures are recorded by a cameraman or a static camera. The recorded video consists of the complete training room including trainer, students and the projector screen. In regular lectures, presenter will speak more than changing presentation slides; hence more time will be spent in explaining the slide. Video recording of such lectures will not have changes in consequent frames. The goal of system is to record and telecast the talks that have minimum impact on the people giving talks and people watching them[5].

Product Perspective

The project suggests that the camera should be mounted on the central back hall and at the eye level of the audience. Under this setup, the lecturer and screen can be captured in our recording.

Lecturer Detection:

Assume that there is only one person standing in the front of the lecture room, and that person is our lecturer. We also assume that the lecturer would face to the audience, and then his or her face will be shown in the video because our camera is mounted on the back wall. Under the above assumptions, we can apply face detection method to locate the lecturer's face. We will detect face of lecturer using Haar classifier , Haar face detection involves two stages: training stage where the classifier is trained to detect faces and testing stage where the detection of face takes place in real-time.[7] Screen Detection: In the lecture scenes, the brightness of the screen is higher than the others. We can use this features to detect the screen location. At first, we calculate the gray histogram of the input image, and then use Otsu's methods to calculate the threshold to filter the brighter blobs in the image. Each blob is calculated out the aspect ratio and size to decide the screen region. Let a be the blob size and A be size of the minimum square cover this blob. Since a screen must be 4:3 aspect ratios in square shape, we will filter those blobs with large aspect ratio, small area ration a/A, and small size.

Following are the main steps in this project:
1. Capture Video Module: Captures running video from the camera and stores it on the file system.
2. Filter Input Image: Presentation screen and the presenter should be filtered from the input image.
3. Apply image filtering techniques: Apply various image filtering techniques.

Benefits Of Smart Lecture Recording And Broadcasting
Benefit of teacher:
1. With the request from teachers, the recording lectures will automatically be published to the courses in the eLearning platform and only students in those courses have the right to access it.
2. Teachers can reuse the recording content for another term.

Benefit of Student:
1. Students can view the recordings according to their own time schedule.
2. Students view recordings as podcasts or on a standard web browser. Recordings are also customized for viewing on mobile devices.
3. Students can jump to specific content on the videos easily as the recordings are indexed and there is also a search function.

It has been argued that videoing face-to-face lectures can provide students with a valuable resource to complement their studies Students can watch the videoed lecture to revisit any points that they did not understand whilst watching the lecture face-to-face. Furthermore, they can stop, start and rewind the video to address their specific needs. In fact, software has been developed that enables students to personalise a videoed lecture by adding their own annotations. On a more practical level, videoing lectures allows students to catch up if they miss a face-to-face lecture. This also enables them to adopt a more flexible learning pattern if they wish. Despite these suggested benefits, few evaluations have been conducted. Furthermore, the evaluations that have been conducted show conflicting findings. Some indicate that videoed lectures can improve students' grades and increase their overall level of satisfaction and confidence with the course .However, other work found that the availability of videoed lectures made no significant difference .There is also conflicting evidence surrounding whether providing video recordings of lectures has an adverse affect on attendance .

Conclusion
The use of the Internet as a teaching tool continues to grow in popularity at colleges and universities.
Ultimately, a student only has a limited time to spend on a course outside of class, student travelling cost and time will get saved as student can watch video from his place. Our System will automatically filter out the projector screen and the presenter face when it appears in front of the camera and produce optimal video of a small size with good quality so students can watch it without hesitation(less time will need to load video).

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