On Using On-The-Fly Student's Notes in Video Lecture Indexing

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Abstract- **The large number of video lectures within digital archives is making critical the indexing and retrieval process. Indeed, most of the systems base the indexing process on few generic text information (e.g., course title and teachers name) and this creates problems to students who are looking for very specific topics and hence want to browse video in details. Moreover, additional metadata could pro-vide useful information to those users who access the educational materials by means of assistive technologies. In this systems, we propose an approach that allows students to take on-the-y notes while watching a video lecture and uses these notes to enrich video lectures with metadata that will be helpful to the indexing and retrieval process. In particular, to allow detailed video browsing, our proposed Social Learning (SOLE) system defines a set of eight pre-defined tag- notes and segments the lecture into a sequence of video chapters. Students can use the textual notes to describe and to retrieve the video material, providing hints about its content to users with special needs. To evaluate our approach, we developed a proto-type version of SOLE and we asked for volunteer evaluators. Results showed that users feel comfortable in taking notes while watching a video and liked to browse video lectures using notes. According to the results obtained in the evaluation, both students and video lecture providers might appreciate the proposed approach.**

Index Terms- **Youtube, Speech to Text, SOLE, Feature Extraction, Prototypes, Indexing.**

1. INTRODUCTION

The advances in networking and multimedia technologies have led to the widespread use and availability of digital video lectures. In-deed, many educational institutes use video lectures to improve the effectiveness of teaching in and out of classrooms and to support distance-learning students. If on the one side, this process increases the availability of educational material, on the other side, the large number of video lectures within digital archives is making critical the indexing and retrieval process. The main challenge that video lecture providers are facing is how to retrieve the appropriate video. Currently, most of the systems index video material according to few textual information like course title, teachers name and keywords, and the retrieval process provides students with a list of full-length (e.g., 60 or 90 minutes) video lectures. Since the requested information is often covered by only a few minutes of the video lecture, it is often cumbersome for students to search through an entire video, or across many videos, in order to find what they are looking for; the problem is exacerbated if students are not familiar with the area, or if the topic is very specific, or if they access by means of assistive technologies, in particular screen readers and screen magnifiers or if they need captions. Therefore, a mechanism able to and the proper lecture and the proper position inside a video lecture would be highly appreciated by both students and providers. The most critical challenge to build this system is the recognition of teaching topics: without these information it is not possible to browse videos is details. In literature, there are two different approaches to understand the contents of a video: manual or automatic. The manual approach can provide a very accurate and detailed description, but it is time-consuming and expensive; the automatic approach is usually based on low-level audio/video analysis, but, unfortunately, traditional image/audio analysis techniques may fail when applied to video lectures due to the heterogeneity of the material (e.g. slide- based video vs. teacher-based video, high definition vs low definition cameras) and due the little correlation of low level feature with educational videos. In this system, we propose a different approach to index video lecture material. Motivated by the popularity of tag-ging, we propose an approach that involves students in the indexing

process. In particular, we focus on students notes to enrich video lectures with metadata that will be helpful to the indexing and retrieval process, improving its accessibility. However, since the note taking process may be distracting, it is necessary to keep this process as simple as possible. To this aim, our proposed SOcial LEarning(SOLE) system defines a set of eight predefined tag-notes and allows students to use these notes both to describe and to retrieve the video material. The complexity of the system is maintained at the back-end: here the system splits the video lecture into several video chapters, keeps track of the expressed notes and computes the pre-dominant note of every single video chapter. In particular, SOLE has the following goals: i) notes must be the ones of students and should not be extracted from low level audio/video features, ii) the note taking process must not distract students and must not interrupt the video play out, iii) students must be able to take their notes on-the-y (e.g., viewers may take as many notes as they want while watching a video), and iv) students notes should be associated to specific video chapters and not only to the entire video lecture. To achieve these goals, SOLE: i) fosters social tagging, ii) uses a discrete space of pre-defined notes (e.g., To Know, Important, Recommended, Interesting, Confused, Not Clear, Boring and Pointless),and iii) uses low-level video features analysis to segment the video lesson into video chapters. By harvesting all the notes expressed by students and by performing an analysis on them, SOLE provides students to learn the easiest way.

2. RELATED WORK

The advances in networking and multimedia technologies have led to the widespread use and availability of digital video lectures. Indeed, many educational institutes use video lectures to improve the effectiveness of teaching in and out of classrooms and to support distance-learning students. If on the one side, this process increases the availability of educational material, on the other side, the large number of video lectures within digital archives is making critical the indexing and retrieval process. The main challenge that video lecture providers are facing is how to retrieve the appropriate video. Currently, most of the systems index video material according to few textual information like course title, teachers name and keywords, and the retrieval process provides students with a list of full-length (e.g., 60 or 90 minutes) video lectures. Since the requested information is often covered by only a few minutes of the video lecture, it is often cumbersome for students to search through an entire video, or across many videos, in order to find what they are looking for; the problem is exacerbated if students are not familiar with the area, or if the topic is very specific, or if they access by means of assistive technologies, in particular screen readers and screen magnifiers or if they need captions. Therefore, a mechanism able to find the proper lecture and the proper position inside a video lecture would be highly appreciated by both students and providers.

3. PROBLEM STATEMENT

To design a system Approach that allows students to take on the notes while watching a video lecture and uses these notes to enrich video lectures with metadata that will be helpful to indexing and retrieval process.

4. GOALS and OBJECTIVES

Goals:

1. notes must be the ones of students and should not be extracted from low level audio/video features.
2. the note taking process must not distract students and must not interrupt the video play out, iii) students must be able to take their notes on-the-y (e.g., viewers may take as many notes as they want while watching a video), and
3. students notes should be associated
4. to specific video chapters and not only to the entire video lecture.

Objectives:

1. provide ownership over learning and direction of learning.
2. help the student for memory recall.
3. Improve sense of trust with teacher.
4. Incorporation of external learning into classroom topics
5. provide Greater interest in topics from students
6. provide Greater opportunities for interpersonal and intrapersonal learning to occur.

5. SYSTEM ARCHITECTURE

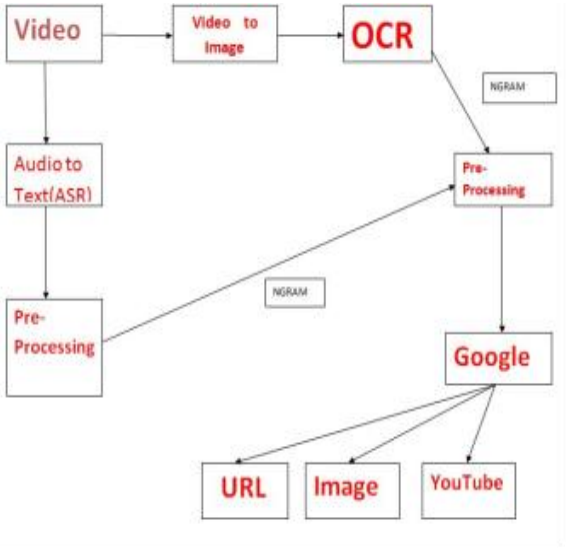

Fig -1: System Architecture

The architecture of the proposed system is shown in figure The user is first authorised and authenticated .The service provider provides the facility of less storage on the cloud. This _les are first encrypted using AES 256 bit Algorithm a key is generated. This key is again encrypted by R-LWE algorithm. Then this files are fragmented and multiple copies are created and are stored at traceable locations on cloud. This will help the authorized user to locate the required file correctly without complication. The user input query Firstly encrypted with AES ans RLWE if the query matching conditions are satisfied then only the user can download and further decrypt the file. But if any unauthorized person tries to access the files, due to the complications in the reformation of files he will be unable to get the original copy. Here the security and the privacy measures are handled.

6. MATHEMATICAL MODEL

S=U, I, O, P

Where,

U = Set of users

Ui = {u1,u2,u3,... ... ...,un}

Where n>0

= ex. Primary user.

I = Set of Inputs

Ii = {i1, i2, i3,... ... ..., in}

Where n>0

Output=

P = Set of Processes

Pi = {p1,p2,p3,... ... ...,pn}

Where n>0

7. SYSTEM OVERVIEW

Fig -2: User Registration Form

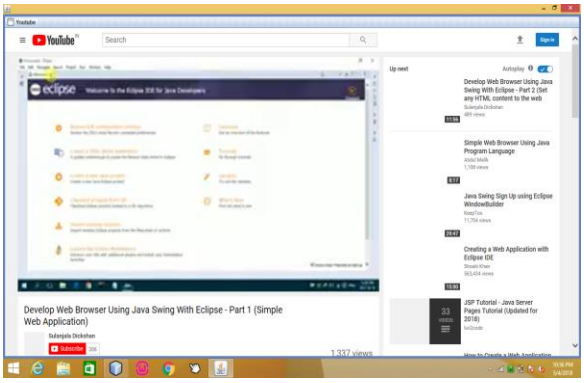

Fig -3: Youtube Video Player

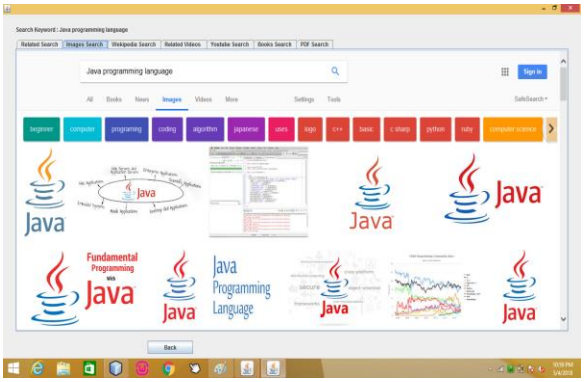

Fig -4: Keyword Serach

8. CONCLUSION

Motivated by the limitations of current video lecture systems, in the system, we proposed SOLE a novel approach to index video lectures. SOLE fosters social tagging, uses a discrete notes space to categorize students notes and allows students to take their notes on-the-y while watching a video lecture. To evaluate SOLE at this early stage, we developed a prototype version and we asked for volunteer participants to test the proposal. According to the results obtained in

the MOS evaluation, students appreciated both the SOLE prototype and the idea of using notes to index and to browse video lectures. Therefore, the use of on-the-y students notes can be considered an helpful approach to handle video material in video lecture archives.

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