International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 07 | July 2022 www.irjet.net p-ISSN: 2395-0072

SUMMARY GENERATION FOR LECTURING VIDEOS

R Anish[1], Shashank P[3], Suraiya Anjum[3], Sushma K[4], Prof. Puneeth P[5]

[1,2,3,4,5] Department of Information Science and Engineering, Maharaja Institute of Technology, Mysore, Karnataka, India

---

ABSTRACT

Online lectures and online courses share the same mass conceptual content all stored into one large video. As the world is progressing towards advancement in the technology so is the production of high volume, high density data. Many universities adapted to e-learning due to the pandemic and not all will access these videos multiple times to understand the concepts as they are long. Thus the extraction of important and useful topics from the lecturing videos is the area which hasn't been explored in great yet. Particular area is having a huge potential of research and implementation as far as the real applications are concerned. Video highlights or synopsis is the abstraction of the main events in video or image collection. It is used in order to highlight the entire video to easily interpret what it is being tried to conclude. With this highlighting process we can easily understand and revise on concepts that are important and parts of videos containing interest. highlight videos of important concepts which will ease the process of revision and learning. Content highlights facilitates us in simplifying the learning process. One of our main objectives is to save time and access the important topics which is required by the viewer as fast as possible.

Keywords: Yake, EasyOCR, frame selection, text detection.

I. INTRODUCTION

The internet is flooded with an enormous amount of videos and texts can quickly scan the text and see if there is any content in the video. Summary versions of the videos will be a life saving asset. Recorded videos of lectures are gaining popularity as a basic tool for distance education as well as a supplementary tool for face-to-face education. Students get information from videos, but the time cost of going through these videos especially for long lecture videos will be high, so to solve this, we need to automatically capture the gist and essential topics in the videos, the video summary meets this requirement. Video summarization is defined as the process of generating a summary of a long video by selecting the most informative for the user. This thesis emphasizes the survey for generating lecture summaries where we use CV2 for video to image conversion, easyOCR for text detection, merging and generating video summary with text generation.

II. LITERATURE REVIEW

[1] In this paper a framework for automatic summarization of videos. The SumBot framework is specially designed for scenarios where the summarization process follows a semi-structured editing template.

[2] In this paper the anchor-based DSNet approach formulates the video summary as a focus detection problem and the importance score and position from the generated interest suggestions

[3] In this paper an incremental framework for subset selection. At each point, it updates the set of representatives with the previously selected set of representatives and the new data stack.

[4] In this paper A PCDL framework for video summarization tasks that generate video summaries using a dual learning framework and constraints on summarization properties.

[5] In this paper A novel approach to a deep video summary called AD Sum is used to generate the summary.

[6] In this paper, automatic cricket video highlights will be generated by considering some of the criteria like scores, audience voice and change in the score.

[7] In this paper The static and motion similarity scores of clips with the appropriate adaptation thresholds are used to merge consistent clips. Use local static and motion similarities to adjust the boundaries between clips.

[8] In this paper A scene change detection algorithm based on position analysis has been proposed for frame rate up-conversion. The proposed algorithm calculates statistics after generating a 2D histogram to extract the shape of the histogram.

III. SURVEY FINDINGS

Generating short summaries or highlights of recorded video content is an essential task not only for publishing content on video sharing platforms, but also for video asset management. The algorithms used are a video summary created with unpaired data and a deep learning framework with unpaired data. Video summaries are intended to create a concise summary to extract the most useful parts of the video. This is essential for humans to effectively and efficiently search and understand large amounts of video data in a user-friendly way. This is usually formulated as a supervised learning problem that learns a spatiotemporal mapping function for selecting keyframes or subframes from a video sequence.

IV. METHODOLOGY

Our algorithm uses the textual information for extraction method. The textual information which is extracted from each frame. First it recognizes the title in the slide and convert the text of the title into a sentence based on the algorithms like OCR and CNN. When textual information is available, title differences are recognized and information about topics that have changed for each topic is provided. This forms the basis for detecting changes in the scene. This captures the frames where the scene changes occur and combines them to create highlights. OCR(Optical character recognition) converts the digital image into a machine-coded text electronically. Here, the digital image is generally an image including a region similar to the characters of the language. OCR can be used in artificial intelligence, pattern recognition and computer vision. This is because the new OCR is trained by providing sample data that is executed via machine learning algorithms. This technique of extracting text from an image is usually done in a work environment where you are certain that the image contains text data.

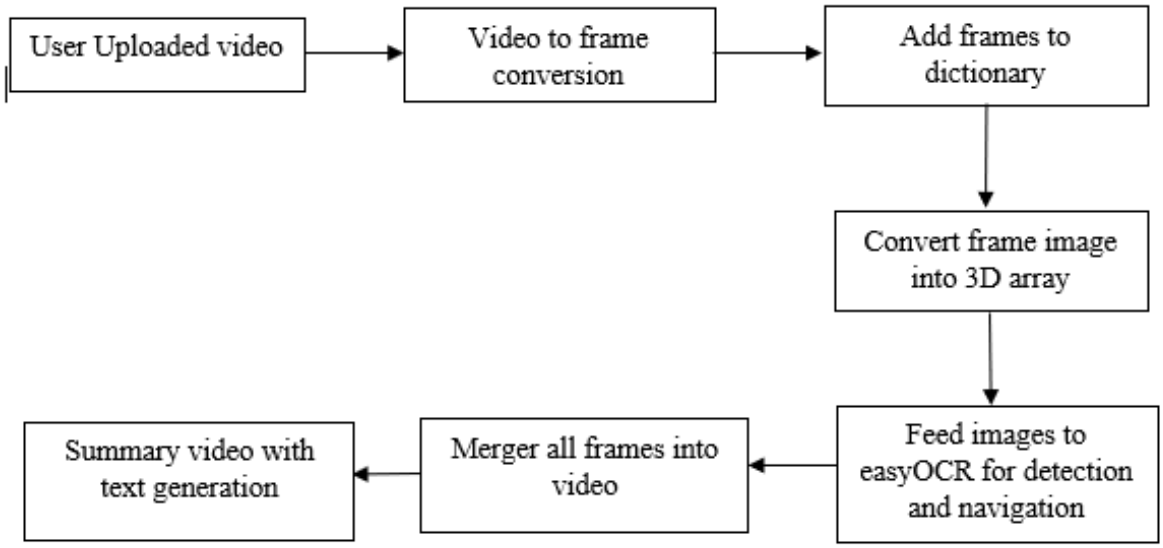

Figure 1: System Architecture.

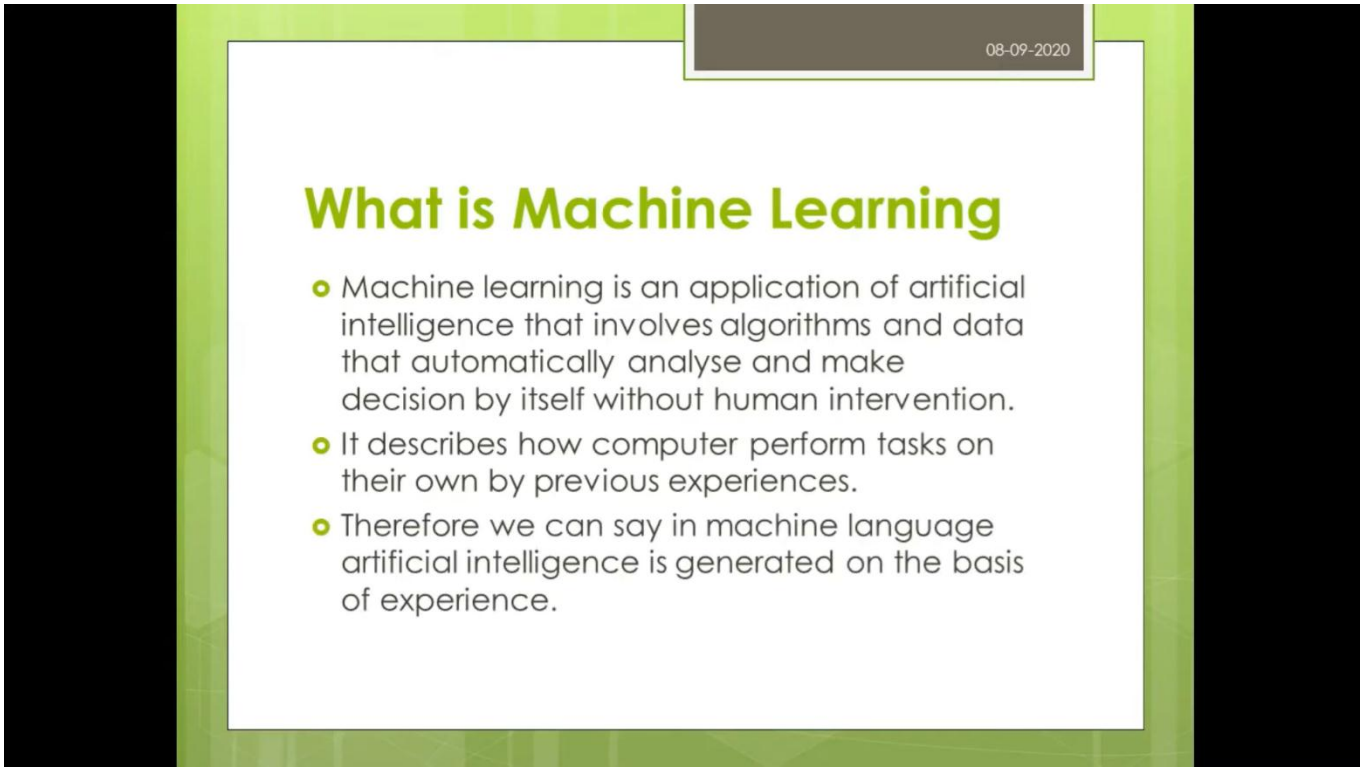

Figure 2 : Video Snapshot

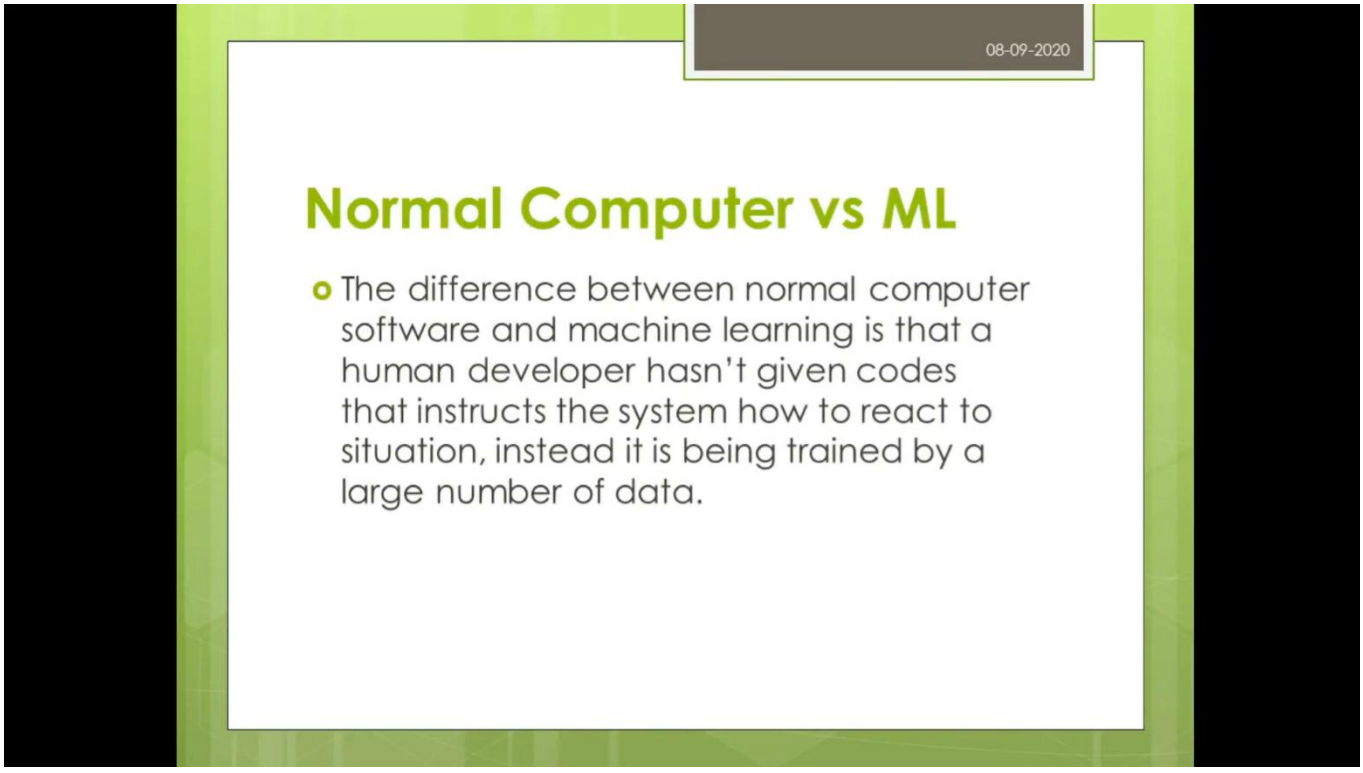

Figure 3 : Video Snapshot.

V. DATA FLOW DIAGRAMS

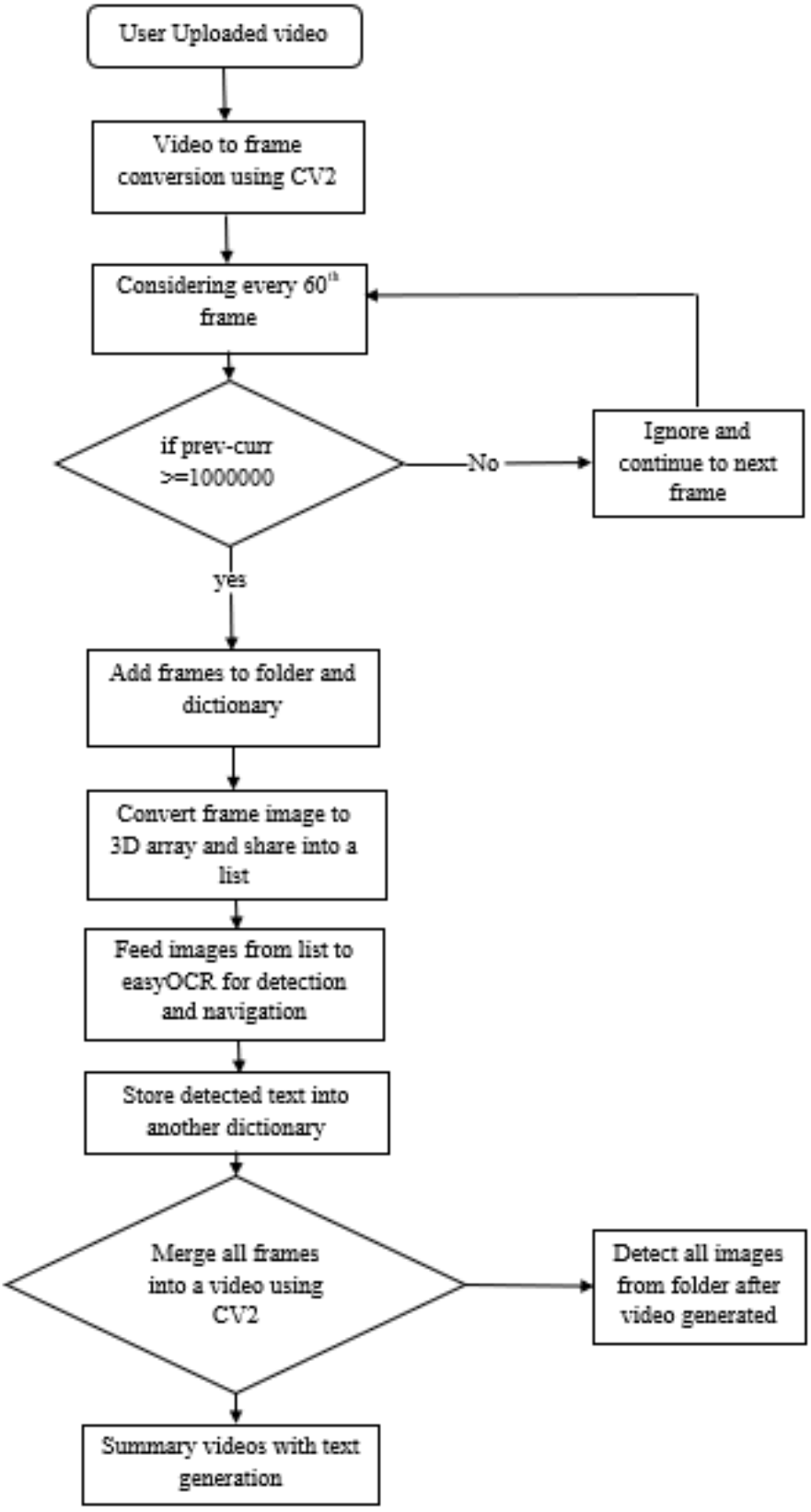

Figure 4: Dataflow diagram to novel approach of summary generation of lecturing videos

VI. USE CASE MODEL

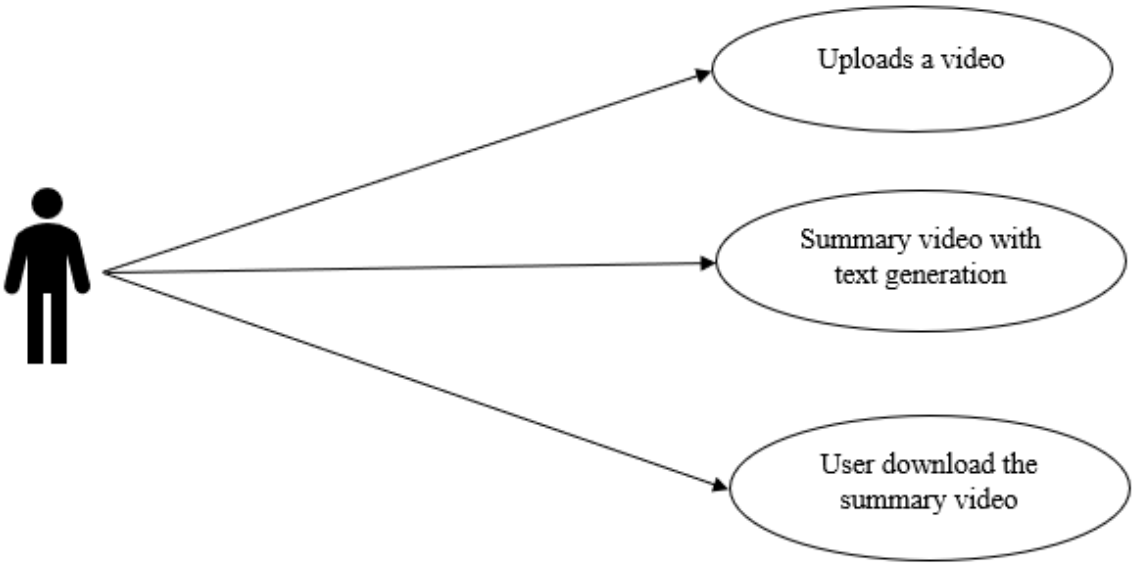

Figure 5: Use Case Model

VII. RESULTS AND DISCUSSION

Here we tried to generate the summary for PowerPoint-based lecturing videos which is very much beneficial for students. Where the user needs to upload a lecturing video using the user interface provided, once the video is uploaded successfully, a summary video with text is generated. Once the video is generated the user should copy the link and paste it into the browser to download the summarized video.

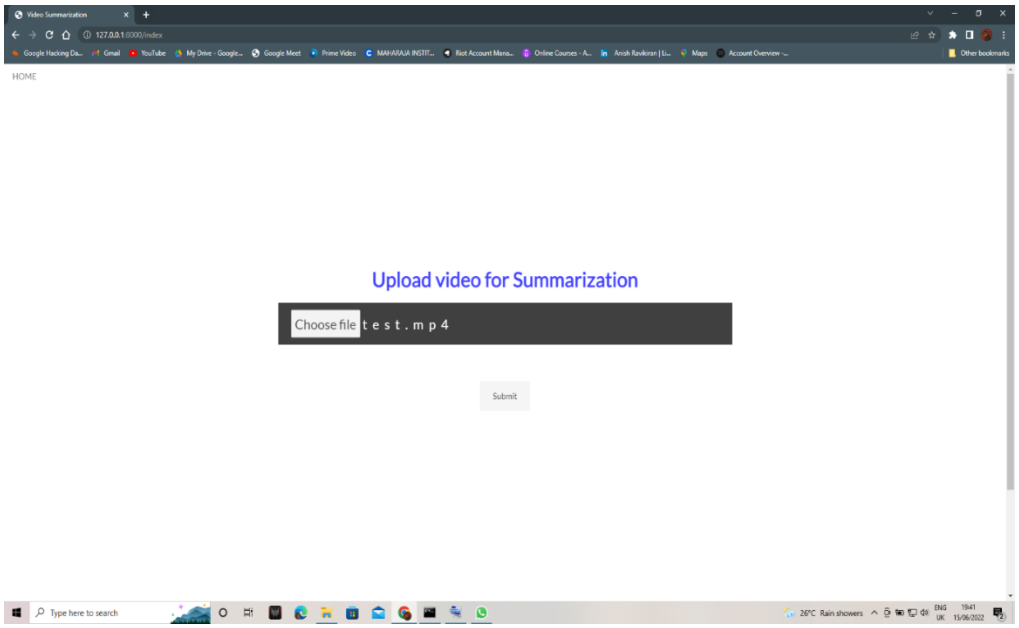

Figure 3: User Interface.

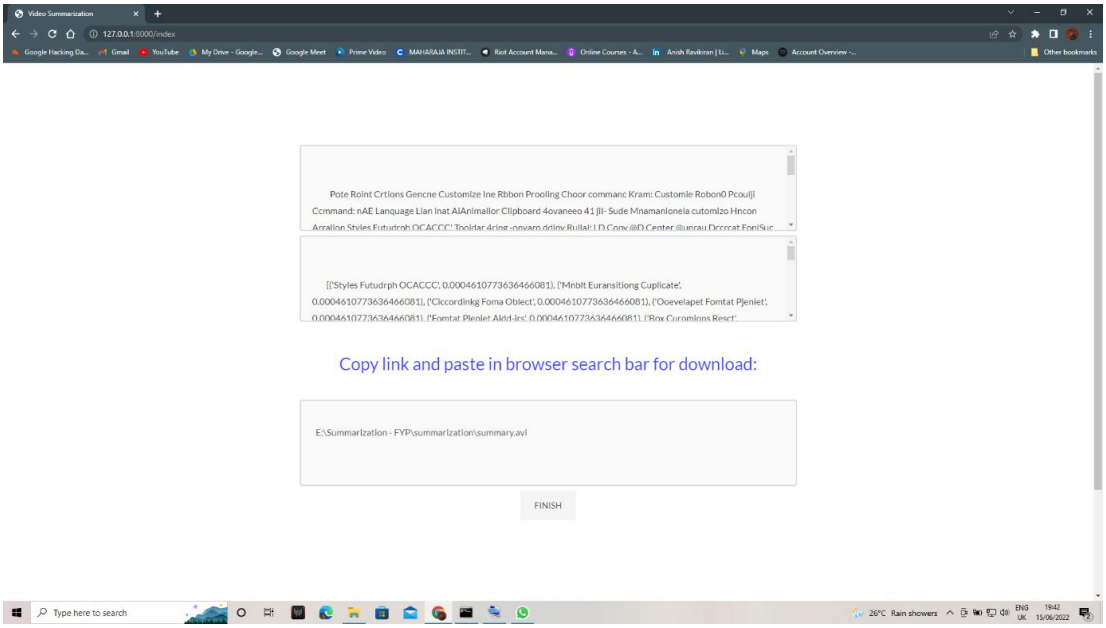

Figure 4: Summary Video with Text Generation

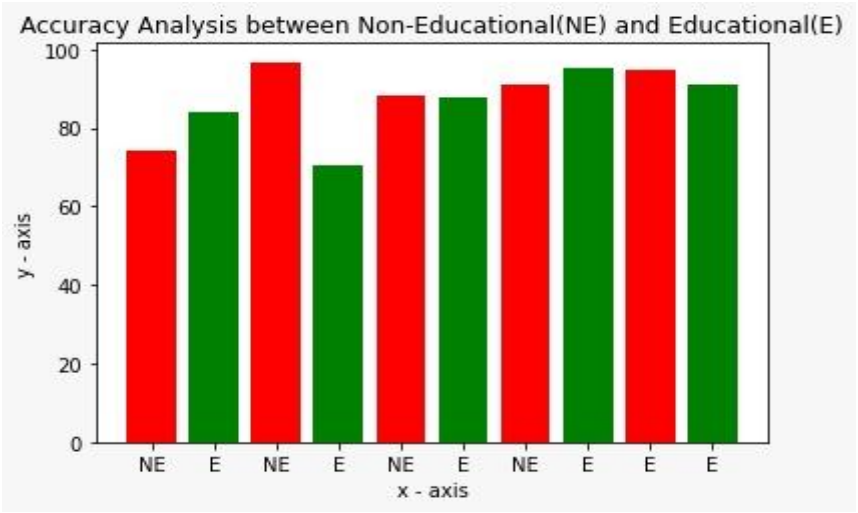

Figure 5: Accuracy Analysis between non-educational and educational videos

VII. CONCLUSION

The main aim of this project is a summary generation for lecturing videos Video Summarization or synopsis is the abstraction of the main events in video or image collection.it is used to summarize the entire lecturing video and provide only the important concepts that is being covered in that session. With this summarization process, we can easily understand and revise concepts that are important and parts of videos containing interest. The proposed system will generate highlights of PowerPoint presentation videos and blackboard taught videos by extracting the text from the images/frames of the videos and identifying the change in textual information between frames. Some important concepts may or may not be identified properly in the case of poor video/image quality.

IX. FUTURE WORK

In our proposed system we are implementing it only for the PowerPoint-based lecturing videos. In view of future enhancement, we try to implement the video summarization technique for chalk and board lecturing videos in which the machine needs to be trained in a very efficient manner to provide the expected output.

X. REFERENCES

[1] "SumBot: Summarize Videos Like a Human" by Hongxiang Gu, Stefano Petrangeli and Viswanathan Swaminathan in 2020.

[2] "DSNet: A Flexible Detect-to-Summarize Network for Video Summarization" by Wencheng Zhu, Jiwen Lu, Jiahao Li and Jie Zhou in 2021

[3] "Online Summarization via Submodular and Convex Optimization" by Ehsan Elhamifar and M. Clara De Paolis Kaluza in 2017

[4] " Property-Constrained Dual Learning for Video Summarization " by Bin Zhao, Xuelong Li and Xiaoqiang Lu in 2019.

[5] "Deep Attentive Video Summarization With Distribution Consistency Learning" by Zhong Ji, Yuxiao Zhao, Yanwei Pang, Xi Li and Jungong Han in 2020.

[6] "A Multimodal approach for automatic cricket video summarization" by Aman Bhalla , Arpit Ahuja , Pradeep Pant and Ankush Mittal in 2019.

[7] " Unsupervised Video Summarization based on consistent clip generation" By Xin Ai, Yan Song , Zechao Li in 2018.

[8] "Positional analysis-based scene change detection algorithm" by Suk-Ju-Kang in 2015.

[9] " Video Summarization by learning from unpaired data " by Mrigank Rochan and Yang Wang in 2020.

[10] "Video Summarization by learning deep side semantic embedding" By Yitian yuan, Tao Mei , Peng cui and Wenwu Zhu in 2017.

[11] "Unsupervised Video Summarization Framework using Key-Frame Extraction and Video Skimming" by Shruti Fadon and Mahmood Jasim in 2020.

[12] "A New Approach to Extracting Sports Highlights " by Pichet Suksai and Paruj Ratanworabhan in 2016.

[13] "An Efficient Framework for Automatic Highlights Generation from Sport Videos" by Ali Javeed, Khalid Bhasir Bajura, Hafiz Malik, Aun Irtaza in 2016.

[14] "Video Summarization via Action Ranking " by Mohammed Elfek and Ali Baj in 2019.

[15] "Cloud-Assisted Multi-View Video Summarization Using CNN and Bi-LSTM " by Tanvir Hussain, Khan Mohammed, Amin Ullah, Zehong Cao, Sungwook Baik and Victor Hugo De Alborquerque in 2019. Summary Generation for Lecturing Videos 2021-22 Department of ISE, MIT Mysore 23.

[16] "Automatic Tour Video Summarization Focusing on Scene Change for Advance Touristic Experience" by e Yuki Kanaya, Shogo Kawanaka, Hirohiko Suwa Yutaka Arakawa and Keiichi Yasumoto in 2019.

[17] "Hybrid Approach for Video Compression Based on Scene Change Detection" by Ankita P. Chauhan, Rohit R. Parmar , Shankar K. Parmar , Shahida G. Chauhan in 2013.

[18] "A Novel Key-frames Selection Framework for Comprehensive Video Summarization" by Cheng Huang and Hongmei Wang in 2018.

[19] "User-Ranking Video Summarization with Multi-Stage Spatio-Temporal Representation" by Siyu Huang, Xi Li, Zhongfei Zhang, Fei Wu, and Junwei Han in 2018.

[20] "Meta Learning for Task-Driven Video Summarization" by Xuelong Li, Fellow, IEEE, Hongli Li, and Yongsheng Dong in 2019.