Cricket Video to Text Summarization Using Neural Networks

I. Introduction

This project introduces an innovative approach that focuses on extracting key highlights and events of a cricket match, to generate a concise textual summary by utilizing advance neural networks. The proposed system aims to outperform and overcome the limitations of traditionally summarizing systems. The proposed system uses a combination of various technologies like VGG16 Convolutional Neural Networks (CNNs), Optical Character Recognition (OCR) and Long Short-Term Memory Recurrent Neural Networks (RNNs) to build a powerful neural network architecture. This systemallows transforming visual cues into short textual summaries which can be easily understandable by varied category of viewers. This technology of transmuting complex information into written summaries brings an entirely new way to produce insights and review matches effectively. By integrating neural networks into this process, the information extracted from cricket sport videos passesthrough one more layer of refinement and comes off as a unique text summary. Ultimately, this project aims to make a potential next stage of easier access to streamlined cricket content, without making the trouble that sports coverage often experiences.

II. Project Objectives

This project is designed to revolutionize the analysis of cricket match videos by implementing a multi-faceted approach, leveraging advanced technologies for enhanced information extraction and summarization. The key objectives are outlined as follows:

1. Frame Generation:

- Generate frames from the provided cricket match video input.
- Implement a mechanism to eliminate redundant frames, optimizing the analysis process for subsequent stages.

2. OCR Model for Player Information Extraction:

- Develop a robust Optical Character Recognition (OCR) model tailored to extract pertinent information, including names and scores, from cricket players (bowlers, batsmen, fielders) featured in each frame.

3. Transcripts Creation:

- Create detailed transcripts for each frame, capturing and accurately describing the nuanced actions taking place during the cricket match.

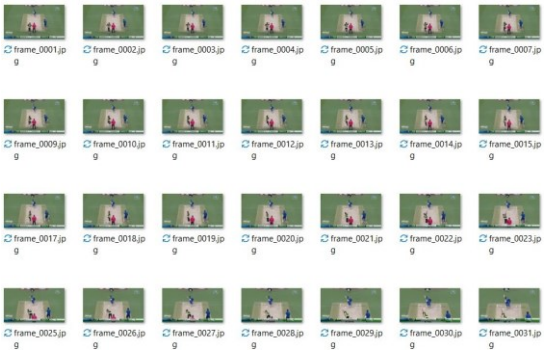
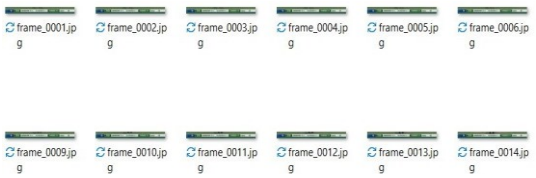
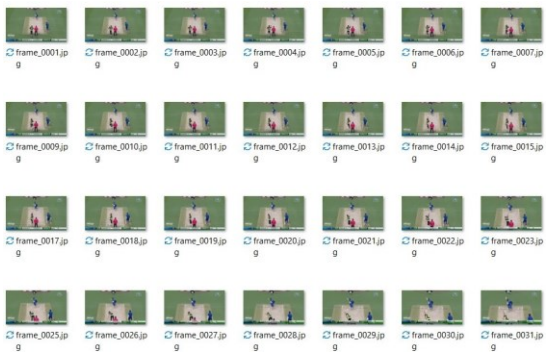
4. Transcripts Generation with OCR Integration:

- Integrate information derived from the OCR model, incorporating player names and scores, into the raw transcripts.
- Generate comprehensive transcripts that provide a meticulous and accurate account of the events unfolding in each frame.

5. Match Summary Generation:

- Utilize the detailed transcripts generated in the previous stage to construct a concise textual summary encompassing all significant events that transpired during the cricket match.

III. Expected Outcomes

Module name	Input	Output	Completed
Frame Generation	 *Figure 1 Cricket video*	 *Figure 2 Extracted frames*	**Yes**
OCR Model	 *Figure 3 Scoreboard from frames*	10 aQeee= SM MY ZIKGMM GUNARATHNE* 47.03) KULASEKARA12() EEDLICUEQOG overs 18 11 aes 3M M/IKGMM GUNARATHNE* 47.0) KULASEKARA12() (EEELICUEQOEM overs 18 12 aQeee= 3M MIKI GUNARATHNE* 47.03) KULASEKARA12() EEDLINUENOM overs 18 13 aQeee= SM MY ZIKGME GUNARATHNE* 47.03) KULASEKARA 12") EELINUEQOGM overs 18 14 Sees) M MY ZIKGMM GUNARATHNE* 47.03) KULASEKARA 12") EEELICUENOGM overs 18 15 ae MN MY /IKGMM GUNARATHNE* 47.0) KULASEKARA12") EELICUENOGM overs 18 16 ae SM MIKI GUNARATHNE* 47.03) KULASEKARA12() (EELINUEQOEM overs 18 *Figure 4 Player Names, Score*	**Yes**
Transcripts Creation	 *Figure 5 Frames*	Downloading data from https://storage.googleapis.com/tensorflow/keras 553467904/553467096 [==========] - 4s 0us/step startseq ball is going straight towards the fielder endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball is going towards the fielder endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball is going towards the batsman endseq startseq ball is going towards the batsman endseq startseq ball is going straight towards the fielder endseq *Figure 6 Transcripts for each frame*	**Yes**
Transcripts Generation	553467904/553467096 [==========] - 4s 0us/step startseq ball is going straight towards the fielder endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq startseq ball goes away as fielders try to get hold of it endseq + 10 aQeee= SM MY ZIKGMM GUNARATHNE* 47.03) KULASEKARA12() EEDLICUEQOG overs 18 11 aes 3M M/IKGMM GUNARATHNE* 47.0) KULASEKARA12() (EEELICUEQOEM overs 18 12 aQeee= 3M MIKI GUNARATHNE* 47.03) KULASEKARA12() EEDLINUENOM overs 18 13 aQeee= SM MY ZIKGME GUNARATHNE* 47.03) KULASEKARA 12") EELINUEQOGM overs 18 14 Sees) M MY ZIKGMM GUNARATHNE* 47.03) KULASEKARA 12") EEELICUENOGM overs 18 15 ae MN MY /IKGMM GUNARATHNE* 47.0) KULASEKARA12") EELICUENOGM overs 18 *Figure 7 Transcripts + Data from OCR*	**(Yet to do)**	**No**

Summary Generation	**(Yet to do)**	**(Yet to do)**	**No**