techniques to augment the monetization potential of the live broadcast feed. The audiences for sporting events expect more engagement with the game and hence there is a need for a system and method for analyzing the live video broadcast stream of the sporting event to deliver more contextual interactive content in real-time. Traditional techniques require complex hardware for implementation and additional cameras either in the playing field/court or elsewhere are needed to capture the data which leads to expensive system requirements.

[0007] A live video broadcast stream consists of a series of frames. Frames per second (fps) indicates the number of frames that exist in a timeframe of 1 second. The duration of a single frame is referred to as frame persistence duration or frame duration (1000ms/fps). For example, in a 25 fps video, each second will consist of 25 frames and each frame will persist on the screen for a total of 1000/25 = 40 ms. To provide contextual interactive content to the audience in real-time, all the processing activities should occur within this timeframe in order keep up with the live broadcast feed. Otherwise, by the time one frame is processed, subsequent frames will be lost. Hence, there is a long felt but unresolved need for a system and a method for analyzing the live video broadcast stream within the frame persistence duration or the frame duration.

[0008] Hence, there is a long felt but unresolved need for a system and a method for analyzing a live video broadcast stream of a sporting event to deliver contextual interactive content for the audience in real-time to enhance their viewership and augment the monetization potential of existing content for the broadcasting companies and advertisers.

SUMMARY OF THE INVENTION

[0008a] According to a first aspect of the present invention, there is provided a sports analytics system incorporating a computer server for analyzing a live video broadcast stream of a sporting event, said sports analytics system comprising:

a video demuxer for receiving said live video broadcast stream of said sporting event from a video capture device and splitting said received live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream;

a non-transitory computer readable storage media for storing computer program instructions defined by modules of said sports analytics system; and

at least one processor communicatively coupled to said non-transitory computer readable storage media, said at least one processor configured to execute said computer program instructions defined by said modules of said sports analytics system, said modules comprising:

an analytics module for analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream, wherein said analytics module comprises:

a detection module for detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

a tracking module for tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

a recognition module for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey

recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame;

a comparison module for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

a transmission module for transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval, wherein said live video broadcast stream is transformed into an interactive video comprising said contextual interactive content of said identified players and wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said hypertext transfer protocol live stream.

[0008b] According to a second aspect of the present invention, there is provided a method for analyzing a live video broadcast stream of a sporting event, the method employing a sports analytics system comprising at least one processor configured to execute computer program instructions for performing said method, said method comprising:

receiving said live video broadcast stream of said sporting event from a video capturing device, by a video demuxer of said sports analytics system;

splitting said live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream, by said video demuxer of said sports analytics system;

analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream, wherein said analysis comprises:

detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame; and

identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval;

whereby said live video broadcast stream is transformed into an interactive video comprising said contextual interactive content of said identified players and transmitted to said user device; and

wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping graphics of said hypertext transfer protocol live stream.

[0008c] According to a third aspect of the present invention, there is provided a non-transitory computer readable storage medium having embodied thereon, computer program codes comprising instructions executable by at least one processor for

analyzing a live video broadcast stream of a sporting event, said computer program codes comprising:

a first computer program code for receiving said live video broadcast stream of said sporting event from one or more video capturing devices;

a second computer program code for splitting said live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream;

a third computer program code for analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream;

a fourth computer program code for detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

a fifth computer program code for tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

a sixth computer program code for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition performed in said frame;

a seventh computer program code for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

an eighth computer program code for transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of

said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval, wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said hypertext transfer protocol live stream.

[0008d] According to a fourth aspect of the present invention, there is provided a sports analytics system incorporating a computer server for analyzing a pre-recorded video stream of a sporting event, said sports analytics system comprising:

a non-transitory computer readable storage media for storing computer program instructions defined by modules of said sports analytics system; and

at least one processor communicatively coupled to said non-transitory computer readable storage media, said at least one processor configured to execute said computer program instructions defined by said modules of said sports analytics system, said modules comprising:

an analytics module for analyzing said pre-recorded video stream, wherein said analytics module comprises:

a detection module for detecting one or more persons present in a frame of said pre-recorded video stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

a tracking module for tracking said detected persons in said frame, by analyzing one or more preceding frames;

a recognition module for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition

when said facial recognition, said person recognition, and said jersey recognition are performed in said frame;

a comparison module for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

a transmission module for transmitting said pre-recorded video stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system, wherein said pre-recorded video stream is transformed into an interactive video comprising said contextual interactive content of said identified players, and wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said pre-recorded video stream.

[0008e] According to a fifth aspect of the present invention, there is provided a method for analyzing a pre-recorded video stream of a sporting event, the method employing a sports analytics system comprising at least one processor configured to execute computer program instructions for performing said method, said method comprising:

analyzing said pre-recorded video stream, wherein said analysis comprises:

detecting one or more persons present in a frame of said pre-recorded video stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

tracking said detected persons in said frame, by analyzing one or more preceding frames;

recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition

when said facial recognition, said person recognition, and said jersey recognition are performed in said frame; and

identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

transmitting said pre-recorded video stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system;

whereby said pre-recorded video stream is transformed into an interactive video comprising said contextual interactive content of said identified players and transmitted to said user device; and

wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said pre-recorded video stream.

[0009] This summary is provided to introduce a selection of concepts in a simplified form that are further disclosed in the detailed description of the invention. This summary is not intended to determine the scope of the claimed subject matter.

WHAT IS CLAIMED IS:

1. A sports analytics system incorporating a computer server for analyzing a live video broadcast stream of a sporting event, said sports analytics system comprising:

a video demuxer for receiving said live video broadcast stream of said sporting event from a video capture device and splitting said received live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream;

a non-transitory computer readable storage media for storing computer program instructions defined by modules of said sports analytics system; and

at least one processor communicatively coupled to said non-transitory computer readable storage media, said at least one processor configured to execute said computer program instructions defined by said modules of said sports analytics system, said modules comprising:

an analytics module for analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream, wherein said analytics module comprises:

a detection module for detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

a tracking module for tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

a recognition module for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a

commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame;

a comparison module for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

a transmission module for transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval, wherein said live video broadcast stream is transformed into an interactive video comprising said contextual interactive content of said identified players and wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said hypertext transfer protocol live stream.

2. The sports analytics system as claimed in claim 1, wherein if any of said facial recognition, said person recognition, and said jersey recognition is unavailable, said recognition module uses one or more of said live score feed and said commentary for said identification of said one or more players in said frame.

3. The sports analytics system as claimed in claim 1, wherein said predetermined time interval is less than a frame persistence time of said frame.

4. The sports analytics system as claimed in claim 1, wherein said jersey recognition comprises one or more of jersey number classification and team recognition.

5. The sports analytics system as claimed in claim 1, wherein said individual weights are determined based on clarity of each person recognized in said frame.

6. The sports analytics system as claimed in claim 1, wherein said client application comprises an interaction module for providing user interaction with said interactive video.

7. The sports analytics system as claimed in claim 1, wherein said contextual interactive content of said identified players comprises a dynamic display of one or more of a scorecard, player information, and match statistics, wherein said contextual interactive content of said identified players is configured to be customized and shared on social media.

8. A method for analyzing a live video broadcast stream of a sporting event, the method employing a sports analytics system comprising at least one processor configured to execute computer program instructions for performing said method, said method comprising:

receiving said live video broadcast stream of said sporting event from a video capturing device, by a video demuxer of said sports analytics system;

splitting said live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream, by said video demuxer of said sports analytics system;

analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream, wherein said analysis comprises:

detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame; and

identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval;

whereby said live video broadcast stream is transformed into an interactive video comprising said contextual interactive content of said identified players and transmitted to said user device; and

wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping graphics of said hypertext transfer protocol live stream.

9. The method as claimed in claim 8, wherein if any of said facial recognition, said person recognition, and said jersey recognition is unavailable, one or more of said live score feed and said commentary is used for said identification of said one or more players in said frame.

10. The method as claimed in claim 8, wherein said predetermined time interval is less than a frame persistence time of said frame.

11. The method as claimed in claim 8, wherein said jersey recognition comprises one or more of jersey number classification and team recognition.

12. The method as claimed in claim 8, wherein said individual weights are determined based on clarity of each person recognized in said frame.

13. The method as claimed in claim 8, wherein a user can interact with one or more of said identified players in said interactive video.

14. The method as claimed in claim 8, wherein said contextual interactive content of said identified players comprises a dynamic display of one or more of a scorecard, player information, and match statistics, wherein said contextual interactive content of said identified players is configured to be customized and shared on social media.

15. A non-transitory computer readable storage medium having embodied thereon, computer program codes comprising instructions executable by at least one processor for analyzing a live video broadcast stream of a sporting event, said computer program codes comprising:

a first computer program code for receiving said live video broadcast stream of said sporting event from one or more video capturing devices;

a second computer program code for splitting said live video broadcast stream into a real time messaging protocol stream and a hypertext transfer protocol live stream;

a third computer program code for analyzing said real time messaging protocol stream within a predetermined time interval, wherein said predetermined time interval corresponds to a phase difference between said real time messaging protocol stream and said hypertext transfer protocol live stream;

a fourth computer program code for detecting one or more persons present in a frame of said real time messaging protocol stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person

detection, and a jersey number detection based on availability of said first set of cues;

a fifth computer program code for tracking said detected persons in said frame, by analyzing one or more preceding frames of said real time messaging protocol stream;

a sixth computer program code for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a live score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition performed in said frame;

a seventh computer program code for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

an eighth computer program code for transmitting said hypertext transfer protocol live stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system within said predetermined time interval, wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said hypertext transfer protocol live stream.

16. The non-transitory computer readable storage medium as claimed in claim 15, wherein if any of said facial recognition, said person recognition, and said jersey recognition is unavailable, one or more of said live score feed and said commentary is used for said identification of said one or more players in said frame.

17. The non-transitory computer readable storage medium as claimed in claim 15, wherein said computer program codes further comprise a ninth computer program code for providing user interaction with said interactive video.

18. The non-transitory computer readable storage medium as claimed in claim 15, wherein said predetermined time interval is less than a frame persistence time of said frame.

19. The non-transitory computer readable storage medium as claimed in claim 15, wherein said jersey recognition comprises one or more of jersey number classification and team recognition.

20. The non-transitory computer readable storage medium as claimed in claim 15, wherein said individual weights are determined based on clarity of each person recognized in said frame.

21. The non-transitory computer readable storage medium as claimed in claim 15, wherein said contextual interactive content of said identified players comprises a dynamic display of one or more of a scorecard, player information, and match statistics, wherein said contextual interactive content of said identified players is configured to be customized and shared on social media.

22. A sports analytics system incorporating a computer server for analyzing a pre-recorded video stream of a sporting event, said sports analytics system comprising:
a non-transitory computer readable storage media for storing computer program instructions defined by modules of said sports analytics system; and
at least one processor communicatively coupled to said non-transitory computer readable storage media, said at least one processor configured to execute said computer program instructions defined by said modules of said sports analytics system, said modules comprising:

an analytics module for analyzing said pre-recorded video stream, wherein said analytics module comprises:

a detection module for detecting one or more persons present in a frame of said pre-recorded video stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

a tracking module for tracking said detected persons in said frame, by analyzing one or more preceding frames;

a recognition module for recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame;

a comparison module for identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

a transmission module for transmitting said pre-recorded video stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system, wherein said pre-recorded video stream is transformed into an interactive video comprising said contextual interactive content of said identified players, and wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said pre-recorded video stream.

23. A method for analyzing a pre-recorded video stream of a sporting event, the method employing a sports analytics system comprising at least one processor configured to execute computer program instructions for performing said method, said method comprising:

analyzing said pre-recorded video stream, wherein said analysis comprises:

detecting one or more persons present in a frame of said pre-recorded video stream, using one or more cues selected from a first set of cues comprising a facial detection, a head detection, a person detection, and a jersey number detection based on availability of said first set of cues;

tracking said detected persons in said frame, by analyzing one or more preceding frames;

recognizing said tracked persons in said frame using one or more cues selected from a second set of cues comprising a facial recognition, a person recognition, a jersey recognition, a score feed of said sporting event, and a commentary of said sporting event based on availability of said second set of cues, wherein individual weights are assigned to each of said facial recognition, said person recognition, and said jersey recognition when said facial recognition, said person recognition, and said jersey recognition are performed in said frame; and

identifying one or more players in said frame by comparing said assigned weights for each of said recognized persons with pre-existing data of all players; and

transmitting said pre-recorded video stream and analysis data comprising contextual interactive content of said identified players to a client application provided on a user device by said sports analytics system;

whereby said pre-recorded video stream is transformed into an interactive video comprising said contextual interactive content of said identified players and transmitted to said user device; and

wherein said contextual interactive content of said identified players is displayed on said user device without said contextual interactive content of said identified players overlapping existing graphics of said pre-recorded video stream.