**Voice-Interactive, Immersive Sports Experience**

A Question and Answering system for sports domain using video analysis.

**Team 6 - Affinity**

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**Project Goal and Objectives:**

**Background**

Since the popularization of virtual reality, the focus has predominantly centered around gaming. This can be attributed to a variety of factors such as the gaming community’s tendency to embrace new technologies and the familiarity of computer-generated graphics to gamers. Now that virtual reality has become more familiar to mainstream consumers there is a push to expand its use into other areas of entertainment, including professional sports. Over the past year or so major sports broadcasting companies, such as FOX Sports and NBC, have partnered with tech startups to release 360°, immersive VR coverage of select sporting events like the 2016 Summer Olympic Games and the 2015 NBA season opener.

**Motivation**

While VR for sports content has proven to be a promising market, there continues to be a number of aspects that can be enhanced to provide a more enjoyable user experience. One problem is where and how to display relevant information to the user. In a 360° environment care must be taken not to obstruct the user’s view while displaying information. Another opportunity for improvement is the lack of control for users to determine what information they want and when they want it. Finally, a third concern is the limited methods of interaction between the user and the environment. The aim of this project is to address these issues by allowing the user to interact with the VR environment via voice commands. Voice interaction would improve the first issue by allowing the system to respond to voice commands with audio feedback, rather than visual, thus reducing the amount of screen clutter. User’s would also gain control of the information they receive by using voice queries to request the information they need. By utilizing voice commands users would have another, more natural, method of interaction with system in addition to headset buttons and remote controls that are included with many current VR headsets.

**Significance/Uniqueness**

Voice controlled computer systems have been in existence for some time and used in a variety of academic and commercial fields. However, the use of voice commands within virtual reality environments has appeared only recently. For virtual reality professional sports coverage, the ability for viewers to use voice-interaction is non-existent. This can most likely be attributed to relatively recent emergence of the VR sports market. The majority of effort in early development was placed on capturing high-quality footage in a format that could be viewed in 360°. Now that the concept of VR sports has been established and shown promise in marketability, efforts should shift to enhancing the viewer’s experience by providing new features.

**Objectives**

Although this project will focus on improving interactions with VR sports content, the ideas and results would apply to a variety of other media. Our primary purpose is to take an experience that has traditionally been static and enable it to be user controlled in a natural way. In doing so, we expect the outcome to improve the user’s visual experience by reducing the amount of data displayed over visual content, enhance the overall experience by providing relevant contextual information when the user wants it, and promote increased adoption of VR for entertainment purposes outside of gaming through intuitive user interactions.

**System Features**

The main feature of the system is to answer a specific question asked by a user related to a sport video. A few of the examples that user could ask the system are:

* *Game info - Who’s winning? What quarter is it? How many hard until first down?*
* *Player statistics - What’s the pitcher’s ERA? How many assists has Kobe made so far?*
* *Switch view perspectives - Take me to the fifty-yard line.*

**Related Work**

Currently, there are several tech startups which partner with broadcasting companies and major league sports. A few of the projects that are related to this project are:

* *Fox Sports VR[7]*
* *NextVR[11]*
* *EON Sports[12]*
* *LiveLikeVR[13]*
* Virtually Live[14] - virtual reconstruction, social aspect

Research and products incorporating voice control and VR:

* *VoiceBot[8] - voice powered game control*
* *Modbox[9] - VR multiplayer sandbox game*
* *VRIO[10] - speech processing unit for VR and real-world scenarios*
* *VR Speech Synthesis[6]*

**Backup project**

Environment audio radar - software will analyze the surrounding area and describe it to the user. This software will be useful for the visually impaired people. For example the program can help such people to cross the street or to move around the house. This is an application of video summarization, where the analysis of the video is provided to the user either in the form of audio description or in the form of video annotations.

**Bibliography**

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