

Identify plays based upon video footage

Karam Shbeb
Innopolis University
k.shbeb@innopolis.university

Mohammad Shahin
Innopolis University
m.shahin@innopolis.university

Mahmoud Darwish
Innopolis University
m.darwish@innopolis.university

Abstract—This document is a project proposal for the Practical Machine Learning and Deep Learning course. Our project aims to detect football (soccer) passes, including throw-ins and crosses.

applying machine learning to improve tracking systems and data extractions could contribute to the world of automating football data extraction which can lead to fully autonomous systems that can extract all data from football games without human intervention.

I. DESCRIPTION

Our work will help scale the data collection process. Automatic event annotation could enable event data from currently unexplored competitions, like youth or semi-professional leagues or even training sessions.

In this project, we shall create a system that is capable of detecting several objects on the pitch including the ball and the players. The second stage in the system is to detect the movements of the ball and draw a trajectory on the virtual pitch. Since players in football are allowed to run or walk with the ball, then not every movement of the ball is classified as a pass. Depending on the speed of the ball and its distance to other objects (players or borders of the pitch) the system will decide whether this is a pass or not.

II. DATA

Kaggle's competition DFL - Bundesliga Data Shootout contains train and test data serving the same purpose. Train data includes comprising video recordings from eight games. Both halves are included for four of the games, while only one half is included for the other four games. These videos are appended with events annotations including video id, type of event, descriptive attributes for the event, and the time in seconds when the event occurred within the video. In addition to training and testing, data-sets Kaggle provides clips of ten additional matches without event annotations and they can be used to help the model generalize to environments not represented in the training data.

III. RESULTS AND IMPACT

The proposed system should be able mainly to extract passes in real-time or based on recorded videos from football matches. The system also can be updated to extract other events that occur in a game. Currently, event data is mostly collected manually by human operators, who gather data in several steps and through numerous personnel involved. This manual process has room for innovation as in its current shape and forms it involves a lot of resources and multiple iterations/quality checks. As a result, event data collection is usually reserved for professional competitions only. Completion of this system can provide the world with data from other competitions that aren't available nowadays. Finally,