Interactive tool for quick validation of automatic categorizations of sports images

Duration : 4-6 months
Team : Loki (Inria Lille – Nord Europe & CRISTAL)
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This internship is part of the PerfAnalytics project (ANR PIA-PPR 2020) that consist of a collaboration of various Inria teams, universities, and institutes such as INSEP (French institute for sport and performance), as well as several French sport federations. The student will collaborate with high-performance sport professionals and contribute an interactive tool that will facilitate performance analysis.

Description
To improve the preparation of athletes for sports competitions such as the 2024 Olympic Games, it is necessary to be able to quickly analyze their performances qualitatively, but also quantitatively (using objective measures of performance). A common way is to record these performances in video format to view and analyze them afterwards (see DartFish [1] or SportsCode [2]). However, the analysis, and in particular the annotation, of these videos is a difficult and long process that often wastes more time than provides benefits to the sport teams. Pose recognition [3] and action categorization algorithms (e.g., categorization of boxing hits) can automate the quantification of actions from a video.

While this type of automation can save sports teams time and allow them to scale up by analyzing more videos faster, and thus obtain more reliable and meaningful performance data, it can produce erroneous results that would bias the overall analysis. We therefore plan to design an interactive tool combining the expertise of the human operator and the speed of the detection algorithms. The goal of this internship is to contribute to the design of such a tool, especially the functionalities for the visualization and correction of these errors of the algorithm.

Objectives
- Design and implement an interactive system allowing the validation and correction of automatic categorizations of sports images. The system will have to propose simple and accessible interactions to facilitate the rapid processing of images. Ideally, the system will use technologies that can be easily used on multiple platforms (e.g., web technologies).
- The student will evaluate the interactive system using metrics such as the number of images processed per unit of time to better understand its usability and efficiency.

Candidate
The candidate must show interest in Human-Computer Interaction and demonstrate knowledge in web technologies (knowledge in React is welcome) and/or Python. They will have the opportunity to manipulate and apply related work on interaction techniques, and will participate actively in the design of experiments and evaluation protocols established in HCI.

Références