

# Statistics that help win a match (w/ Video)

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A tracking system for athletes, currently used by the Montreux Volley Masters, provides real-time statistics during the game on players and the ball. Developed by Playfulvision, an EPFL start-up, the device will soon be available for various team sports in a version for GoPro cameras.

At the Montreux Volley Masters 2014, which is taking place through Sunday in Montreux, statistics on movement, the speed of the players and the ball – and even the strike angle – can be viewed online. This is a valuable tool for improving performance. "Obtaining this data during the competition allows us to better assess key moments in the match," explains Georges-André Carrel, coach of the volleyball team at the University of Lausanne (LUC). "For example, we can see which player receives the ball, what he does with it and at what angle, and thereby organize the defense." The overlay of some of these statistics on the images during televisual retransmissions augments the match with new information.

Developed by the start-up Playfulvision, this new tool is about to be used in all international volleyball competitions. A contract was signed with the International Federation (FIVB) in April. Coaches and television stations can select which [statistics](#) they need and how they would like them to be presented: shape, graphics, curves or otherwise. This rookie tool will be responsible for programming these applications, and data will arrive directly on the selected screen. The statistical analysis service will also soon be available in a version developed for the GoPro camera, which makes it readily available to other sports and teams at all levels.

Other sports monitoring systems exist, for example in international soccer competitions and basketball. But this one has several advantages. The Playfulvision system is fully automated, which makes it both easier to install and cheaper. In its professional version six cameras placed around the field or court are connected to a computer.

This innovation is based on three algorithms developed at the Computer Vision Laboratory. Players can always be located on the screen via an overlay with the color of their jersey and number. The challenge was to find how to achieve this recognition continuously, even when in groups and therefore hidden behind others.

The first algorithm detects players in each instant, independent of the preceding or following. It "cuts" the field into small squares (up to 10 cm<sup>2</sup>), simultaneously subtracting the background from any view, and infers the probability of a player's presence in each of the small squares. The second and third algorithms connect the results obtained in each instant to extract the individual trajectories. All of them use global optimization methods that have helped build this very robust system to reliably track people in real time.

In Montreux, the start-up aims above all to demonstrate the range of possibilities of this system to the FIVB before its more extensive use during the world championships taking place this summer. The tracking of results with an iPad is a new feature being developed specifically for this occasion. "The ideal will be of course when the cameras are able to send data to the computer wirelessly. This will further simplify the use of our device," says Horesh Ben Shitrit, CEO of the EPFL spin-off.

Provided by Ecole Polytechnique Federale de Lausanne

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