USING OF SPECIALIZED SOFTWARE IN MODELING OF THROWING INTO THE BASKET HOOP

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Abstract:

The necessity of developing the most efficient learning models adapted to the current society is part of a permanent desire of the specialists in the field, which is no longer possible without a thorough analysis using more and more specialized software and cameras, that can surprise those acts that can easily "escape" from our attention due to the speed of action or complexity of the movement.

Introduction

Evolution in this process of motion has progressed vigorously throughout the 20th century and this is the way you can record and analyze any case from a child with cerebral paralyzed to the performance of a top athlete. Bäumler and Schneider (1989) considered that Aristotle and Platon Stagira were the founding fathers of biomechanics, writing about segments of body movement and animal movement. One notable thing to note is that there are references to the first biomechanical studies dating back to Leonardo da Vinci, Michelangelo Bounarrotti, Galileo, Lagrange, Bernoulli, Euler and Young.

The contribution of Isaac Newton (1642-1727) can not be ignored, no matter how short the biomechanics history is. But a few people, especially physicists, know that its famous laws have been reproduced by their author himself and by analogy with disk discarding, beyond the already known examples.

Another project, which again should not be omitted, is the Kinesiology of Arthur Strunelor (1878-1959), where the author first classed the means of study of locomotion. Recently, biomechanics has developed and expanded due to increased interest in sports performance for solutions in rehabilitation and amelioration in case of cognitive pathology, post-traumatic recovery and even orthopedics. The study of biomechanics has become increasingly organized and cooperative with other branches of study. All these have had a significant interest in applying mechanics to biological problems. Then, at the beginning of the previous century, new technologies were available to study the human body and it's primary movements, it was good that biomechanics pioneers like Marey, Braun and Fischer came to explore these new techniques. In Winter (1990), he used a camera to record movements of the human body. In the same order Muybridge (1887), in the USA, shot 24 chambers to record the patterns of a walking man.

In 1950, biomechanics developed as a significant area of scientific research in various branches of knowledge, based on studies using cinematography. Alley (1984) presented the academic base for a doctoral program.

Anthropocinetics, Biodynamics, Biokinetics, Mechanical Cineanthropology and Kinesiology have emerged due to the proposed designation.

In this way biomechanics shows the necessary measures for the correct acquisition of a technique. Biomechanics of physical exercise study not only active movements, but also body positions conditioned by organs of support and locomotion of the body.

Matveev and Novikov define the fundamental principles as follows: "In pedagogical theory and practice, the notion of methodology includes the ensemble to all methodical means and procedures, which generally characterize the way of accomplishing the formative or educational tasks. The methodology is based on several general principles and at the same time has it's particularity in every specific chapter of education or education. "

Starting from the essence of two fundamental aspects of physical education, we distinguish the methodology of learning movements and the method of educating physical qualities.

According to Dempster, human mechanics presents the body as an ensemble of functional units mobilized one relative to another. Dempster represented the human skeleton through a simplified system consisting of a set of levers.

Material and method:

The shootings was taken at the sports gym of the National College "Eudoxiu Hurmuzachi" in Rădăuţi, in the following picture we will present you a technical drawing with the distances from which the throws took place, but also the place where the room was placed to capture the images needed for this research.

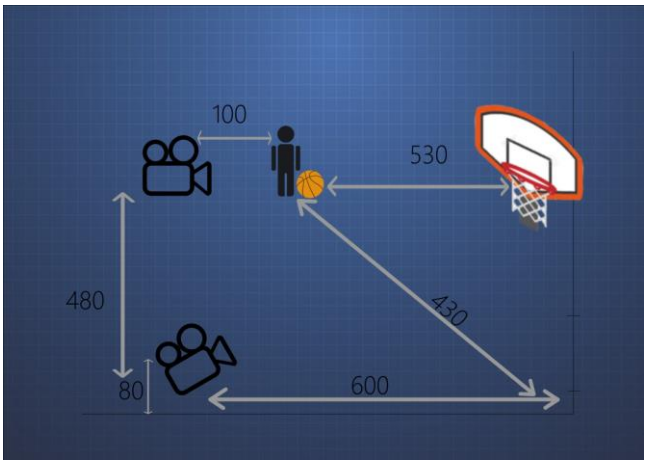

Fig. 1 Diagram of positioning the sportsman and the video camera.

For this study, we chose a single student, with whom we repeatedly made pictures in different positions to capture what we are interested in, namely biomechanics during the basketball, and finally decided to analyze 3 films with a duration of 1 minute and 20 seconds

approximately each. Selected videos will be analyzed using Tracker Video Analysis. This program, as it is defined on the site where we are downloading, is a video and modeling analysis, a software that is easy to install, downloaded from the Internet, built on the Open Source Physics Framework (OSP) Java. This program was specifically designed to be used in physical education. Modeling Video Tracker helps us combine videos with computer modeling. The features of this program are as follows:

- We can track manual and automatic objects with the position, velocity or acceleration overlays and data;
- The mass of an object or several pieces;
- Graphic vectors, vector sums and RGB line;
- Profiles from any angle;

At the same time, the Builder model creates cinematic and dynamic models of mass and system particles, has video filters, brightness / contrast, strobe, ghost trails, and deinterlace filters.

The perspective filter corrects distortions when objects are photographed at a right angle, and a radial distortion filter corrects the distortion associated with fisheye lenses.

The Export Video Wizard allows you to edit and transcode the video, with or without graphic overlay, using the Tracker itself.

Fig. 2 CANON EOS 200D DSLR Camera.

The research was make on the two interpretations shot in different angles. The pictures below are briefly the way digital information is processed and translated into values.
To successfully use TRACKER and all the generated graphics to show real information, we need to start with the following steps:
- From the program menu, we select the ball with maximum accuracy, representing the A / B / C Table (about 0.6kg), a very important point in our research to find out acceleration, trajectory, speed and playing an important role in pursuing improved basket throw on biomechanics analysis.

Results

We import the selected video to calculate the parameters and show the maximum values we can reach to find the best way to throw the ball.
- We create a mass point for each throw (coordinate axes are optional).
- The program can be left by default, the settings are already made, but if we want to emphasize certain values or certain parameters, we can change everything from the main menu.
- The autotracker will automatically detect the ball and following it according to what we want to learn from the trajectory, acceleration speed, etc. (If the clarity of the video is not very good, this tracking of the ball must be done manually).

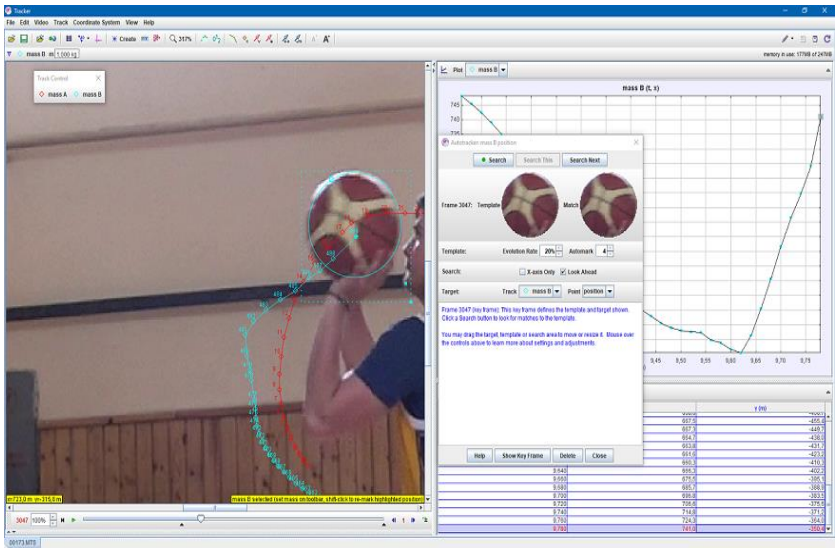

Fig. 3 Example of automatic ball detection.

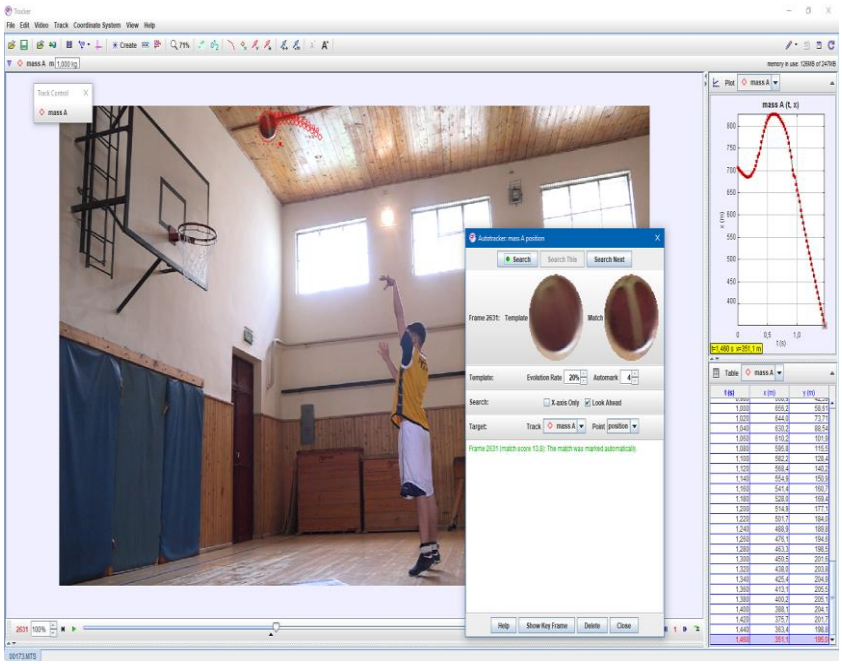

Fig. 4 Parameters obtained in the air phase.

In the following picture, I described as follows:

- The red and blue colors are an example of poor coordination of the progressive movement of the arm in relation to the legs, trunk and flexion of the forearm and palm to the shoulder.
- The purple color represents the optimal position of support of the ball, the angle and the height from which must begin an asceding trajectory towards the basket.

Fig.5 Example of different ball trajectories.

Conclusions:

In conclusion, through this research we tried to highlight as the main objective the realization of a biomechanical basketball basketball analysis in order to improve it's technique.

The biomechanical analysis of basket throws causes us to find new solutions to correct the deficiencies of basketball players training on

throwing techniques. The results of this work could be a basis for shaping and refining throwing in basketball.

I believe that, following a biomechanical analysis, any player regardless of age and gender, closely observing the correlation and synchronization of all parts of the body involved in the move, could constantly improve the effectiveness of basketball basketball technique.

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UTILIZAREA SOFTURILOR SPECIALIZATE ÎN MODELAREA ARUNCĂRII LA COŞ DIN BASCHET

Abstract: Necesitatea elaborării unor modele de învăţare cât mai performante şi adaptate societăţii actuale se înscrie într-un deziderat permanent al specialiştilor din domeniu, lucru ce nu mai este posibil fără o analiză cât mai aprofundată utilizând tot mai des softuri specializate şi camere de luat vederi, pentru a putea surprinde acele acte motrice care pot "scăpa" cu uşurinţă atenţiei noastre ca urmare a vitezei acţiunii sau complexităţii mişcării respective.