

IBV researches different methodologies for the well-being and performance of athletes

- The Eyesport project develops four innovative lines focused on improving the performance of sportsmen and women and their interaction with the sports areas
- The project is funded by the Valencian Institute of Business Competitiveness (IVACE) and the FEDER funds

The **Instituto de Biomecánica (IBV)** has extensive experience in the field of sports innovation. Within this framework, the research centre is working on the Eyesport project, developing different methodologies to increase the well-being and performance of sportsmen and women in their daily lives. The development of this project is supported and funded by the Valencian Institute of Business Competitiveness (IVACE) and the FEDER funds.

The Eyesport project is divided into two main lines of work: on the one hand, it focuses on the sportsperson to improve their sporting efficiency, physical fitness and health. On the other hand, it seeks to improve interaction with sports surfaces.

Kneemotion

One of the lines works on the application of a knee evaluation methodology (called Kneemotion) in the basketball field, with L'Alquería del Baskket as a collaborator. The purpose of this study is to record the capacity of the joint to perform rotational movements. With this, IBV intends to study the feasibility of establishing a system to monitor basketball players, which helps to reduce the impact of the injuries through two fundamental pillars: on the one hand, making it possible to anticipate and prevent knee injuries, by detecting indicators that anticipate the risk prior to breakage. On the other hand, optimize the recuperation process and the return to the game providing medical services with a tool to assist in their treatment. This will lead to a step further in the identification of those biomechanical aspects that allow to detect future problems in advance.

This methodology had just been applying by IBV in other sports like the football, handball and the gymnastic, allowing it to make an extensive database in each sport modality.

Body shape analysis

Within the Eyesport project it is also intended to take advantage of the application of another technology developed by IBV, the application of *3D Avatar Body*, in order to apply its function of scanning and body shape analysis function to the field of sport.

With the company Neogym, is being carried out a research which allows correlate the anthropometric measurements with the performance parameters of the customers. The objective is to combine the application *3D Avatar Body* with the protocol of habitual measures of the users of this gymnasium. This will allow to adapt their physical and performance monitoring derived from the training.

Analysis of the sporting gesture

Another line of investigation developed with Neogym company intends to employ techniques from Artificial Intelligence (AI) and image processing. The objective is to obtain metrics on the speed executed in the exercises and the range of movement only with the use of the Smartphone. This line of research will make possible to analyse and facilitate the training of athletes and their trainers.

In the high performance sport field, IBV is collaborating with the CAR of the Ricardo Tormo Circuit in Valencia to carry out a viability test of combined use of the 4D scanner developed by IBV and thermographic analysis techniques for the study of sports gesture and muscular activity generated by different exercises.

Wear and tear and suitability of the turf

IBV is an accredited laboratory by FIFA for artificial turf football field testing and, since last year, laboratory testing also. In the IBV's labs, various innovative products have been developed to improve both turf and its maintenance.

In this area there are two work lines; on the one hand, a test has been developed in order to find out the suitability of the turf for playing football. Proposing the use of Artificial Intelligence to analyse the trajectory of the ball and its interaction with the grass.

On the other hand, IBV works every day to improve the fibre of the grass, a line of work that started with Nanosport, Safesport and Safesport2 projects. In particular, the use of image recognition techniques to characterise the state of wear of the fibre on football pitches is analysed. With this, IBV pretends to create an algorithm that allows, from photos taken in the field, to automatically label the defects and to give an evaluation of the state of wear of the field in remote.



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As a summary, the Instituto de Biomecánica (IBV) continues to make progress in its R&D work as a reference institution in the field of sport, combining the most advanced technologies.

Finally, the Eyesport project (IMDEEA/2020/90) is funded by the 2020 programme from the Valencian Institute of Business Competitiveness (IVACE) aimed at research centres in the Region of Valencia for the development of R&D projects of a non-economic nature carried out in cooperation with companies, co-funded by FEDER funds within the Operational Programme of the Region of Valencia 2014-2020.

All the information at: <https://www.ibv.org/en/home/>

