FONDAZIONE BRUNO KESSLER
MAGAZINE

5VREAL project: technology innovation for sports

December 2, 2024

The project was designed and implemented by the Free University of Bolzano with EMG Italy, Fondazione Bruno Kessler, Small Pixels and Vodafone Italia. 5VREAL combines 5G and Artificial Intelligence to improve technical analysis and the sports experience, from playing fields to television broadcasting.

Free University of Bolzano, EMG Italy, Fondazione Bruno Kessler, Small Pixels and Vodafone Italia present 5VREAL **– 5G Volleyball Reality Experience & Analytics Live**, a project that aims to transform the way sport, in particular the game of volleyball, is analyzed, experienced and transmitted by combining advanced technologies such as 5G, Artificial Intelligence and Video Analytics systems.

The project, funded by MIMIT's 5G_Axis II Technology Support Program, aims to build a video and analytics system from the real-time acquisition and transmission of footage of volleyball matches.

Thanks to Vodafone's 5G network and EMG Italy's Edge Computing infrastructure, installed at the Broadcast Center in Cologno Monzese for this type of application, it is possible to analyze a large amount of data and reprocess game actions in real time, measuring, for example, the position of the ball during matches, its speed, trajectory and the interval between players' touches. This can be done using non-professional cameras, such as those normally used by sports technical staffs or those on smartphones. The tracking is made possible by advanced AI algorithms, created by the VCL, Vision Computing and Learning Lab (Faculty of Engineering) of the Free University of Bolzano, Italy, Fondazione Bruno Kessler and Small Pixels (an academic spin-off of the University of Florence). Such AI algorithms increase and improve the quality and resolution of images without requiring high-frequency acquisition systems.

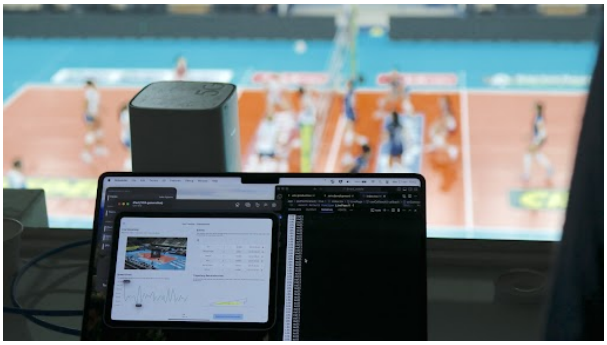
The potential of this technology extends to several areas, each with specific applications. Technical staffs will have real-time access to analytical and automatic data, which currently are instead available only by manual surveying with a consequent degree of approximation. At the same time, TV broadcasting will be enhanced by advanced graphics produced in an innovative yet easy-to-implement way for TV event producers, since the underlying platform is centralized in the Cloud.

5VREAL was presented in a demonstration at Trento's sports hall, the T Quotidiano Arena, where the women's volleyball team "Trentino Volley" was involved. The event provided an opportunity to concretely showcase the project's potential and distinctive features, highlighting how advanced video analytics, Artificial Intelligence and 5G network technologies can transform technical analysis and fan experience in the sport.

"The 5VREAL project has seen the establishment of a consortium of companies, spin-offs, research organizations and universities, which have been engaged in a year-long effort aimed at advancing digital technologies applied to sports and specifically, volleyball. *It is an example of the use of 5G connectivity, vision and artificial intelligence, edge computing, and augmented reality as technological assets in the service of the coach and the public"* stressed **Oswald Lanz, a professor at the School of Engineering at the Free University of Bozen/Bolzano and scientific project leader**.

"We are very happy to have participated in this innovative and multidisciplinary project, putting our broadcast technology at use for new tools that will enrich the offer for spectators," Claudio Cavallotti, CEO of EMG Italy, siad. "This will allow us to be proactive partners with our clients and study new cutting-edge solutions for volleyball as well as other sports. We are also proud to have collaborated with a team of Italian excellence ".

Stefano Messelodi, senior researcher and head of the 5VREAL project for Fondazione Bruno Kessler, stressed, *"The main objective of Fondazione Bruno Kessler's work in 5VREAL was to detect and track, in real time, the position of the 3D ball in the field from three image streams. The main challenges faced are related to the large amount of data to be processed in a very tight timeframe and the difficulty of locating the ball that is often poorly visible due to occlusions, blurring or environmental disturbances."*



“We are proud to have contributed to the 5VREAL project, which shows the transformative potential of generative and real-time AI technologies in improving sports performance,” Fabio Clabot, CEO of Small Pixels, said. ”One of the most relevant use cases is for coaches of volleyball teams, who can now access real-time analytical data, such as ball position, speed and trajectory, using simple non-professional smartphones. ’ This allows them to optimize tactical and technical preparation without the need for expensive or complex tools. ’’’ With 5VREAL, we are bringing innovation directly to the playing fields, improving strategic decisions and offering concrete support to sports teams.”

“5VREAL is an innovative project that transforms fan experience, making it more immersive, and provides coaches with real-time analytics, representing a major step forward in sports innovation,” said Cinzia Campanella, Head of Innovation and Vertical Solutions at Vodafone – Thanks to our 5G network and technology, together with our partners we have developed a platform that can improve the effectiveness of sports analytics, expanding technical analysis and providing a more innovative experience for spectators, paving the way for a future where technology and sports are increasingly integrated.”

FBK team from left to right: Luigi Riz, Sergio Povoli, Fabio Poiesi, Sergio Messelodi – TeV Unit, FBK Digita

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