

## The iBeacon usage in the physical, technical and tactical analysis of players and soccer teams: an exploratory study

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### Abstract

The international professional soccer has an estimated audience of 250 million practitioners and an industry valued at USD 500 billion. The clubs are in a constant process of methodological improvement of training and tactical schemes in order to improve their competitive advantage in the markets they operate. The aim of this research is to create a methodology for physical, technical and tactical analysis of players and clubs, resulting in a product that meets the sports segment.

### Key words:

soccer, iBeacon, sports performance.

### Introduction

iBeacon is a technology developed by Apple to provide a new class of low power consumption and cost of transmission. The technology enables a smartphone or other device to be triggered or perform certain actions when approaching an iBeacon. It works using the Bluetooth Low Energy technology (BLE).

The application of the iBeacon on the optimization of sports performance for professional clubs is an innovation that potentially enhances and supports the competitive advantage of soccer clubs, generating value for all stakeholders in the soccer production chain.

The aim of this research is to create a physical, technical and tactical analysis of players and soccer clubs using the iBeacon technology and proving its economic viability for enterprises in this industry.

### Results and Discussion

Tests were conducted with iBeacons positioned on the soccer field while a mobile application was placed on the penalty area. The results indicated that different iBeacon models had a power oscillation on the generated signal, which provided an inadequate precision for use in a soccer field. Similar software used commercially with a GPS tracking technology have a margin of error tolerance of around 1 meter. The iBeacon devices used provided errors that reached 5 meters, with peaks of up to 10 meters, which showed an inadequacy for the specific application that was planned.

After this procedure, the process of analysis and detection of soccer players was remade using a new application developed that uses recorded videos of matches and performs real-time recordings. The objective is that soccer coaches can make the tactical analysis of a game based on the interaction with a video already available or recording it on the fly, instead of using iBeacons placed on the soccer field.

A screenshot of the mobile application is shown in the following image.



**Image 1.** Mobile app running on an iPad Air 2, showing a tactical analysis of a soccer match.

### Conclusions

Despite the usage of the iBeacon technology proved to be unfeasible because of its inaccuracy, the new approach provided a way to build a new mobile application for physical, technical and tactical analysis of soccer matches, which can be easily expanded to other sports.

The application was fully developed at Unicamp and the software is very competitive compared to other existing solutions on the market. It is now available for free on the App Store and it is currently being tested in the Faculty of Physical Education at Unicamp.

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