

SPORTS MOTION ANALYSIS AND TRACKING SYSTEM

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Introduction

Traditionally, the analysis of player movement during match-play has either been subjectively derived through observation, or objectively measured by film or video analysis. Although most coaches still use observation as their primary method of analysis, there is a growing trend toward more objective methods. There are a number of advantages in using an objective measure: (1) it reduces the error involved; (2) it allows accurate measurement of the physiological responses to match-play. Although video and film analysis is used extensively throughout the world to analyse sporting motion, it is both expensive and time-consuming. As an alternative to using video or film analysis, a low cost and essentially real-time system is being developed.

The Tracking System

The system involves the use of radio frequencies and triangulation to firstly establish the players' position on the field. The structure of the system is displayed in Figure 1.

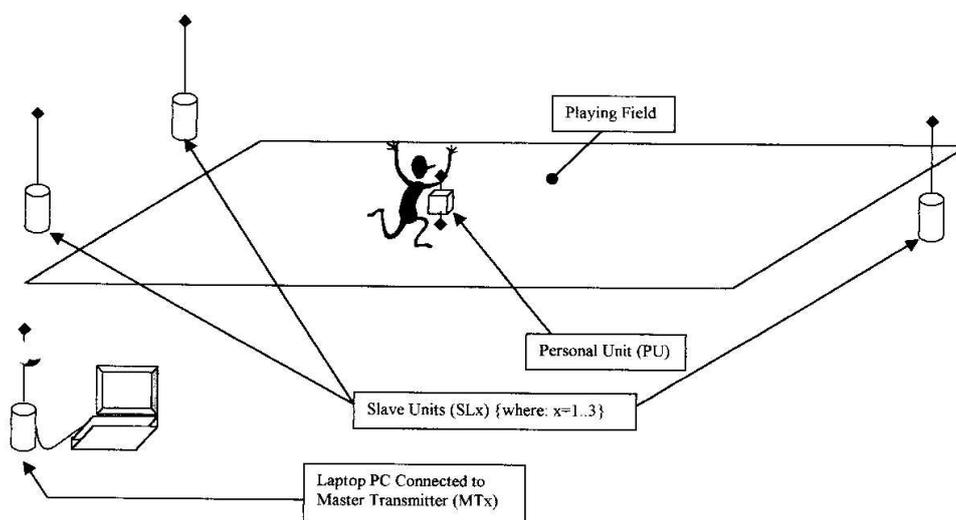


Figure 1. Tracking system structure

The system will comprise 1 master transmitter, 3 slave units and 1 personal unit. The system will sample the players position 500 times per second, thereby allowing very accurate measures of player velocity, acceleration and deceleration. The personal unit will consist of a belt consisting of two transmitter/receiver units operating on different frequencies, thereby allowing player orientation to be determined. This will, in turn, allow measurement of sideways and backward motion. The system will require no more than a laptop PC to function. Initial background research suggests that a resolution greater than 15 cm should be achievable. It is hoped that a prototype will be ready for validation studies by October 1998.

Commercial Viability

We believe the features of this system, such as the ability to analyse player movements almost instantly, coupled with the low cost, will be very attractive to both coaches and sport scientists around the world. The system will be applicable to all sports, although, it is envisaged that it will be primarily used for team sport analysis.