POOLSIDE DEMONSTRATIONS

A KINEMATICAL, IMAGIOLOGICAL, AND ACOUSTICAL BIOFEEDBACK SYSTEM FOR THE TECHNICAL TRAINING IN BREASTSTROKE SWIMMING.


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INTRODUCTION

A system for real-time velocimetric feedback, and for immediate disposal of kinematical data, and model, synchronized with dual-media video images, will be presented.

DESCRIPTION

The system is composed by three different units: (i) a dual-media image setup (Vilas-Boas et al., 1997), upgraded for images in follow-up; (ii) a cable speedometer (Lima et al., 2006), and (iii) a FM transmitter/receiver system, adapted for swimming use, and able to deliver real time velocimetric information to the swimmer and coach. The dual-media follow-up images setup uses a special chariot to move, along the lateral wall of the pool, a set of two video cameras: one underwater camera (Submergible 
AC230V), and one over-water (JVC/GR-SX1, SVHS). The images of both cameras are mixed (Panasonic Digital AV Mixer WJ-AVES), edited (Sony Color Trinitron TV monitor) and recorded (Panasonic AG-7350). Differences in refraction are corrected using the zoom optics of the over-water camera, and a calibration device. The dual-media images are mixed with the display of a PC with kinematical information provided by the speedometer. This is a device for measuring the rotational velocity of a cylinder over which a fine nylon cable is passing through. This cable is fixed to the swimmer at his level. The movement of the cylinder is monitored by a rotating incremental coder connected to a microcontroller (PIC18LF1320, Microchip). A electrical brake motor allow the reduction of the inertia of the all system, keeping the cable straight, and also allows the cable recoil action. The speedometer was also equipped with a audio output, that allow a sound of variable frequency to be sent to the swimmer and coach through AM/FM receivers (Roadstar TRA-2221D) placed below the swimmers cap.

RESULTS

Results are (v) real time curves, synchronized with images, and with corresponding auricular sounds. The software also allows the immediate modelling of a typical stroke cycle, both bimodal or trimodal, displaying mean velocities in noticeable points, mean phase durations and accelerations.

REFERENCES


DEVELOPMENT OF A MULTI-MEDIA SYSTEM FOR KINESIOLOGICAL EVALUATION OF SWIMMING BY EXPERTS IN ANY POOL.

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