A FITNESS ANALYSIS SYSTEM WITH AN INTELLIGENT INTERFACE

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ABSTRACT

One of the problems in the physiological assessment of an athlete is poor communication of the results of the physiological tests to the coach. This thesis describes the development of an expert system, EXFIT designed to bridge the gap between the scientist and the coach and facilitate the provision of scientific information in a systematic and coherent fashion in a report to the coach. The expert system provides generalized recommendations which the coach utilizes in developing specific training schedules suited to the particular athlete to enhance performance. The recommendations are based on a series of physiological analyses of the athlete.

The analyses available in EXFIT are: anaerobic power (peak and total), aerobic power, onset of blood lactate accumulation, maximum blood lactate, blood, muscle structure (fibre type), metabolic status of muscle - aerobic capacity and anaerobic capacity. For two of these analyses, namely the anaerobic power (peak and total) and the aerobic power, provision has been made to allow for both manual and automatic acquisition of the data from the tests for which the data acquisition system was developed as part of this project. The results of the test equipment not presently interfaced to the computer are collected and entered manually.

The implementation of the expert system is described with emphasis placed on recognition of the internal structure of the knowledge, independence from a particular expert system shell and the design for future expansion and maintenance. EXFIT has been split into the four separate modules of user interface, data, information and knowledge. The data and information have been normalized and stored using the knowledge dictionary concept. The design for maintenance was tested by writing a program that allows the domain expert to modify or add to the data and information of EXFIT without the requirement for a knowledge engineer.

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DECLARATION

This thesis has not been submitted in any form for another degree or diploma at any other University and the main text is an original work.