

An Interpretable Data-Driven Approach for the Stratification of the Cardiorespiratory Fitness

Authors : D.Mendes, J. Henriques, P. Carvalho, T. Rocha, S. Paredes, R. Cabiddu, R. Trimer, R. Mendes, A. Borghi-Silva, L. Kaminsky, E. Ashley, R. Arena, J. Myers

Abstract : The continued exploration of clinically relevant predictive models continues to be an important pursuit. Cardiorespiratory fitness (CRF) portends clinical vital information and as such its accurate prediction is of high importance. Therefore, the aim of the current study was to develop a data-driven model, based on computational intelligence techniques and, in particular, clustering approaches, to predict CRF. Two prediction models were implemented and compared: 1) the traditional Wasserman/Hansen Equations; and 2) an interpretable clustering approach. Data used for this analysis were from the 'FRIEND - Fitness Registry and the Importance of Exercise: The National Data Base'; in the present study a subset of 10690 apparently healthy individuals were utilized. The accuracy of the models was performed through the computation of sensitivity, specificity, and geometric mean values. The results show the superiority of the clustering approach in the accurate estimation of CRF (i.e., maximal oxygen consumption).

Keywords : cardiorespiratory fitness, data-driven models, knowledge extraction, machine learning

Conference Title : ICBES 2017 : International Conference on Biomedical Engineering and Systems

Conference Location : Bangkok, Thailand

Conference Dates : August 30-31, 2017