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Abstract

The body fat percentage (BFP) is an important index of fitness with typical healthy range between 14-24% for men and 21-31% for woman. There are many measurement techniques of BFP, but the most accurate ones are complex and require specific laboratory equipment. This study aims to explore how various simple anatomical measurements from a small dataset of body fat percentage can be exploited to simplify BFP predictions with minimal accuracy loss. We examine to what extent the filtering of outliers, the regression method used, the feature engineering of predictors, the selection of predictors and the validation approach can affect the accuracy of predictions with this small dataset. We also compared our results with more traditional methods for BFP prediction. Our best results were obtained with simple regression models with RMS error of 4.283% which is better than traditional approaches. Our analysis also indicated that abdominal circumference is a significant predictor of BFP, while other features such as knee circumference have negative impacts.