

New Body Composition Metrics from Size Stream 3D Body Scanning

David BRUNER, Breck SIEGLINGER, Richard ALLEN
Size Stream LLC, Cary NC, USA

Abstract

This paper describes the development of a group of body composition metrics derived from 3D body scan measurements. Traditional metrics such as body mass index (BMI) have limitations in accurately reflecting body composition, especially for athletes and individuals with higher muscle mass. Size Stream has previously presented the development of body composition metrics such as body fat percentage, lean body mass, maximum waist circumference, and waist to hip ratio. These metrics are well established in the medical literature as being indicators of unhealthy risk conditions at certain values. Here we present new developments for appendicular lean mass, body mineral content, and visceral adipose tissue which also have recognized value in body assessment. The proposed metrics utilize 3D body scans to capture detailed information on body shape, surface area, volume, and other body measurements. Machine learning algorithms were used to develop the new metrics, which were created leveraging the established body composition assessment method of dual-energy x-ray absorptiometry (DXA). The new metrics show correlation between 3D body scan measurements and the ground truth data. These added metrics have the potential to improve body composition assessment and monitoring in clinical, sports, and research settings with convenience and low cost afforded by 3d scanning using smartphone and tablet applications.