

Correlation of Foot Width and Instep Height for Male and Female Feet

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Abstract

Perfect fit is an important factor of footwear comfort. Previous studies have identified high foot width and instep height dispersions for subjects of similar foot length, which confirmed the need for producing footwear in multiple widths. The aim of this study was to analyze the relationship between foot width and instep height. Over 68000 male and 105000 female 3D foot scans from North America were used in this study. The feet were very similar in foot length within each gender. Pearson correlation coefficients between foot width and instep height were calculated, and joint histograms using hexagonal bins were plotted for both genders. Results show that the correlations of foot width and instep height were low for both genders. This means that feet of any width have a wide range of instep heights. Therefore, shoes should be developed in a way that they can fit a wide variety of instep heights, regardless of the shoe width. These results will provide additional information to footwear brands on how to develop footwear to provide proper fit to a large percentage of their customers.

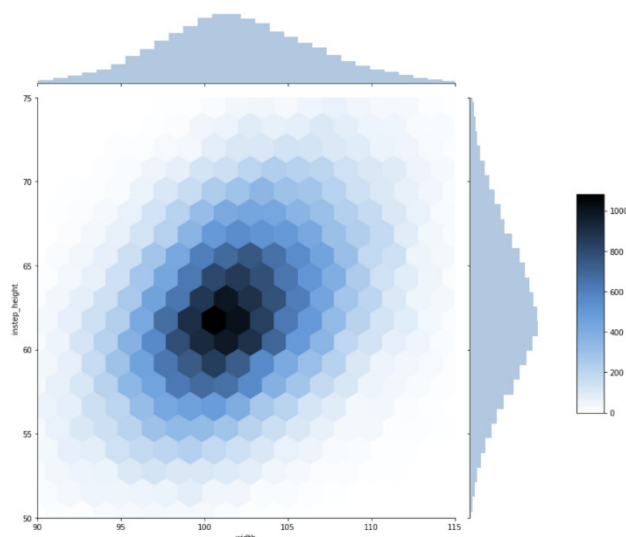


Figure 1: Foot width – instep height joint histogram - male

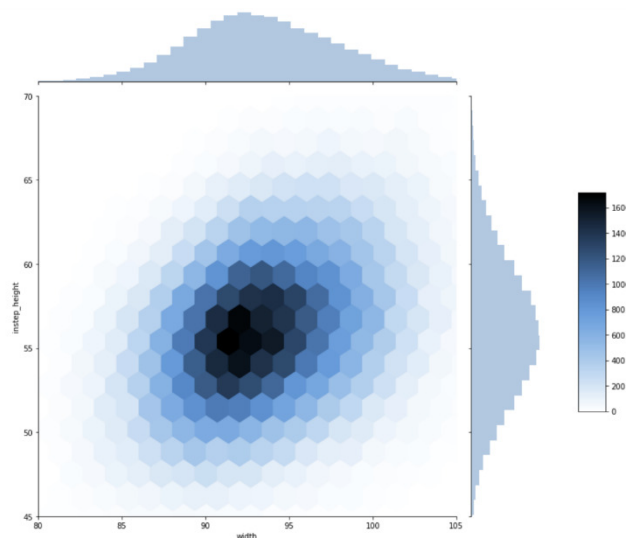


Figure 2: Foot width – instep height joint histogram - female