Stretch Knit Pattern Cutting: Bridging The Gap Between The 2d And 3d Realm for Enhanced Garment Fit

P.U Navodhya[1], R. K. J. De Silva[1] and Simeon Gill[2]

[1] Department of Textile & Apparel Engineering, University of Moratuwa, Moratuwa, Sri Lanka

[2] Department of Materials, University of Manchester, Manchester, UK

This study analyses the theoretical foundations of stretch knit pattern construction, focusing on women's upper torso garments. Designing stretch garments involves balancing optimal body contour, fit, and comfort. In response to this challenge, manufacturers increasingly employ 3D CAD tools for fit assessment and product development, yet disparities persist between physical and digital garments. Successful digital prototyping hinges on the engineering of ease within the pattern draft, including translating 2D pattern dimensions to 3D body size, shape, and proportion.

Three stretch knit pattern drafting methods were reviewed in this study to examine how each method applied the negative ease values. Parametric patterns were drafted using 2D and 3D CAD tools for a UK size 12 Alvaform, using commercially available stretch knit fabric for women's upper body garments. Challenges were identified in being able to engineer optimal negative ease and this could be attributed to a lack of consistent guidance from pattern drafting methods. This limits the establishment of a clear body-to-pattern relationship, where ease is engineered by the pattern technician, in either real or digital fitting environments. Addressing this issue is imperative for translating tacit practitioner knowledge into the digital environment. Key findings advance digital garment production and contour product category produced using stretch fabrics. This knowledge supports parametric pattern drafting for academic and industry settings.

Keywords: body anthropometry, digital prototyping, ease allowance, parametric patterns, stretch knit pattern cutting.