



Topic of the Speech:

Intelligent Garment Size Recommendation for Heterogeneous Body Types Based on Anthropometric Data

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Prof. Bingfei Gu is a Professor and doctoral supervisor, is the vice dean of the College of Fashion at Zhejiang Sci-Tech University. Selected for the Zhejiang Province Leading Talent Young Outstanding Talent Training Program and the University's Teaching and Research Backbone Training Program, and a visiting scholar at the University of Texas at Austin, USA. Engaged in the research and development of fashion digital intelligence technology, wearable products and industrial innovation, has led and participated in more than 10 national and provincial-level scientific research projects, including strategic research and consulting projects of the Chinese Academy of Engineering, National Natural Science Foundation projects, humanities and social sciences projects of the Ministry of Education, later-stage support projects of ethnic theory and policy of the State Ethnic Affairs Commission, and Zhejiang Province Philosophy and Social Sciences Planning projects. More than 70 papers have been published in related fields, among which over 40 are indexed by SCI/SSCI/EI. Five national invention patents have been authorized and three second prizes of provincial and ministerial-level scientific progress awards have been won. She has trained over 30 master's students, guided them to win 5 provincial and ministerial-level awards, and was awarded the title of Provincial outstanding instructor. She serves on the Apparel Professional Committee of Zhejiang Textile Engineering Society and the Youth Editorial Committee of Journal of Textile Research.

Intelligent Garment Size Recommendation for Heterogeneous Body Types Based on Anthropometric Data

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ABSTRACT

A concise and factual abstract, 11pt Times New Roman is required. The abstract should state briefly the purpose of the research, the key results and major conclusions. It must be able to stand alone, references should be avoided. Non-standard or uncommon abbreviations should be avoided.

Garment size mismatch is a prevalent problem in the large-scale distribution of functional clothing, primarily attributed to individual variations in body shape. Conventional sizing methods assume uniform indicator weights for all individuals and employ discrete body type boundaries, thereby neglecting the differential importance of anthropometric indicators across body type groups. This study aimed to develop an intelligent sizing recommendation method that addresses body type heterogeneity. Anthropometric data from 6,068 adults (4,082 males and 1,986 females) were collected and analysed. A hierarchical entropy weighting approach combined with soft body type classification was proposed. Fuzzy C-means clustering was first applied to identify body type groups and compute individual membership degrees across clusters, enabling soft classification that accommodates boundary individuals. The entropy weight method was then employed to determine indicator weights separately for each body type group. Personalised weight vectors were subsequently constructed through membership-weighted fusion, which were integrated into the technique for order preference by similarity to ideal solution for size recommendation. The effectiveness of the proposed method was evaluated through comparison with conventional approaches. Based on the findings, an intelligent sizing recommendation platform was developed, enabling users to obtain automated garment size suggestions by inputting their body measurements. The proposed framework provides an objective and reproducible solution for functional clothing size matching, with potential applications in clothing distribution.

Keywords: functional clothing; size recommendation; body type classification; anthropometry