

## The Customization of 3D Last Form Design Based on Weighted Blending

**Authors :** Shih-Wen Hsiao, Chu-Hsuan Lee, Rong-Qi Chen

**Abstract :** When it comes to last, it is regarded as the critical foundation of shoe design and development. Not only the last relates to the comfort of shoes wearing but also it aids the production of shoe styling and manufacturing. In order to enhance the efficiency and application of last development, a computer aided methodology for customized last form designs is proposed in this study. The reverse engineering is mainly applied to the process of scanning for the last form. Then the minimum energy is used for the revision of surface continuity, the surface of the last is reconstructed with the feature curves of the scanned last. When the surface of a last is reconstructed, based on the foundation of the proposed last form reconstruction module, the weighted arithmetic mean method is applied to the calculation on the shape morphing which differs from the grading for the control mesh of last, and the algorithm of subdivision is used to create the surface of last mesh, thus the feet-fitting 3D last form of different sizes is generated from its original form feature with functions remained. Finally, the practicability of the proposed methodology is verified through later case studies.

**Keywords :** 3D last design, customization, reverse engineering, weighted morphing, shape blending

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