



Body Scanning and Modeling for Custom Fit Garments

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ABSTRACT

Mass customization is a new manufacturing trend in which mass-market products (e.g. apparel) are quickly modified one at a time based on customers' needs. It is an effective competing strategy for maximizing customers' satisfaction and minimizing inventory costs. An automatic body measurement system is essential for apparel mass customization. This paper introduces the development of a body-scanning system, and body size extraction methods and body modeling algorithms. The scanning system utilizes the multi-line triangulation technique to rapidly acquire the surface data of a body, and provides accurate body measurements, many of which are not measurable with conventional methods. Cubic B-spline curves are used to connect and smooth body curves. From the scanned data, a body form can be constructed using linear Coons surfaces. The body form can be used as a digital model of the body for 3D garment design and for virtual try-on of a designed garment. This body scanning system and its application software enable apparel manufacturers to provide custom design services to the consumers seeking personal-fit garments.

KEYWORDS: body scanning, body modeling, virtual garment, mass customization

1. INTRODUCTION

In 1910, the apparel industry started using size designations to produce and sell ready-to-wear clothing. A size designation represents one set of garment sizes in a sizing system designed to reflect the body sizes of most individuals in a population. Because the anthropometric data on which the ready-to-wear sizing system was based was outdated, off-the-rack

clothing does not properly fit the current population. Many surveys showed that about 50% of the women surveyed cannot find well fitting clothes in the current sizing system [2, 6]. Designing garments that fit customers requires information about the individuals' body size and shape. Technology used to quickly modify mass-market products (e.g. apparel) one at a time is known as mass customization and agile