Virtual Makeup using 3D Parametric Human Face Models

Cosmetics and personal care are important consumer industry in advanced countries. In addition to new product development, cosmetic and beauty services have lately received much attention. Taiwan's related industries may not be highly competitive due to a shorter development history compared to other countries. A feasible way to catch up is to enhance the values provided by the related products and services by utilizing the lead of information and telecommunication technologies in Taiwan. Companies should strive to create human-centric innovative services that truly reflect individual requirements. Incorporating adequate marketing activities, those services would become a niche in global competition. To realize such an idea, this research proposes a virtual makeup function using 3D human face models. The geometry of those models is parametrized from large-scale anthropometric data and controlled by facial feature parameters. Highly realistic models generated by text mapping with individual user images on the face geometry work as an effective interface in personalized makeup simulation or other cosmetic applications. Virtual makeup driven by 3D face models overcomes the limitations of the similar technology based on 2D images by allowing physical modeling of human skin using haptic devices. It provides novel user experience with synchronized visual and touch senses while interacting with 3D face models. *Butybox* is a leading e-commerce company in cosmetic and beauty industries. They plan to gain experience in applications of 3D anthropometric data and thus to properly position future marketing as well as technology development.

Keywords: *parametric design*, *cosmetic surgery simulation*, *virtual makeup*, *anthropometric data*