〈シンポジウム〉

『色彩から考える香粧品学〜色がもつ不思議な力と効果〜』

顔検出技術
―写真工業分野での応用と化粧品研究分野への展開―

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Face Detection Technology
―Its Technology Building in Photographic Industry and Its Application Possibility for Cosmetic Research―

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Abstract

　　Today, face detection and recognition technologies are used in various areas including control of images taken with smartphones and personal identification for security purposes. In these technologies, novel recognition techniques like machine learning and deep learning, developed along with the advance of high-speed computing such as parallel computing technique and GPU, are applied. Commercial application of "face detection to control systems digitally based on the detected information" was first launched in the photographic area. Benefits of photo color correction by using skin color information of face had been known among skilled persons in professional photo finishing processes. This knowledge was then provided to users as practical technology through DIGITAL MINILAB（digital photo print system）introduced in the market in late 1990s, enhancing print quality that led to a commercial success. Continuously evolving face detection technology and its related technologies were mounted on digital cameras to be utilized in image capturing control for photo taking and recording, further improving image quality. Such progress was possible because the algorism using machine learning was accelerated to enable image detection almost simultaneously with photo taking. This report provides a review of the face detection technology that evolved in the photographic field first. The face detection technology developed in the photographic area can potentially be applied in research and development of cosmetic products. In the case of evaluation or analysis through face images for efficacy of skin care products and effects of make-up, which requires appropriately processed face photo data, the image technology developed in the photographic area is useful. Additionally, by taking advantage of the face detection technology, blemishes and wrinkles in face images are recognized based on their positions and features. These detection technology and image analyses are briefly explained in this report.

Key words: 　face detection, recognition, machine learning, face image, image analysis.