![University of Wollongong]

Visual and Audio Signal Processing Lab
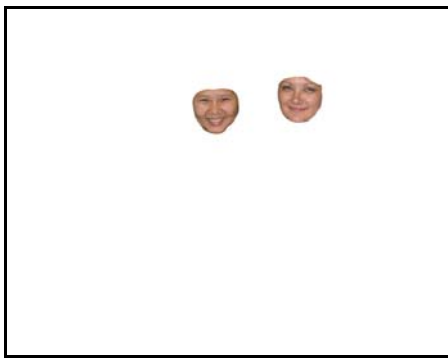
Face and Skin Detection Database

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1. Introduction

The Face and Skin Detection (FSD) Database is created to support research on skin segmentation and face detection. It contains 4,000 colour images that are diverse in terms of the background scenes, lighting conditions, and face and skin types. The lighting conditions include indoor lighting and outdoor lighting; the skin types include whitish, brownish, yellowish, and darkish skins. To provide the ground-truth, all images are meticulously segmented for face regions and skin regions. The skin segmented images consist of all exposed skin regions such as facial skin, neck, arms, and hands. Example images from the database are shown in Fig. 1. The database was prepared over a period of 12 months by S. L. Phung, T. Y. Ke, and F. H. C. Tivive.
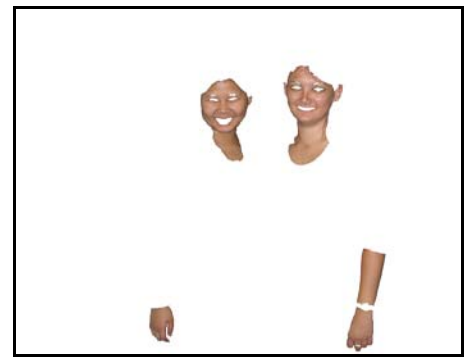
The database is available at: http://www.uow.edu.au/~phung/download.html. To download it, please complete the Release Agreement form at the URL.

(a) Original image   (b) Face segmented image   (c) Skin segmented image

Figure 1: Example images from the Face and Skin Detection Database.

2. Datasets

The database has three data sets (see Table 1). Set 1 consists of 4,000 original colour images. Sets 2 and 3 contain the respective face and skin detection ground-truth for the images in Set 1. The images in Set 1 have names in the form of *im#####.jpg*, where ##### is a five-digit number between 00001 and 04000. The images in Set 2 and 3 have names in the form of im#####_f.bmp and im#####_s.bmp. To improve file preview, the first 2000 images of each data set are stored in subfolder '001', the second 2000 images are stored in subfolder '002'.

Table 1: Data sets of the FSD database.

Dataset	Description	Images	Folder	File name & Format
1	Original colour images	4,000	Original\	im#####.jpg
2	Face segmen ted images	4,000	Face\	im#####_f.bmp
3	Skin segmented images	4,000	Skin\	im#####_s.bmp

Table 2 gives a rough categorization of the skin data set in to different groups of skin types and lighting conditions.

Table 2: Statistics of the skin data set.

Skin Types	Images
Whitish, pinkish	1,665
Yellowish, light brownish	1,402
Reddish, darkish, dark brownish	965
Other skin types	102
Lighting conditions	**Images**
Indoor lighting conditions	1,931
Outdoor lighting conditions	1,855
Other lighting conditions	214

3. Publication

This database is used in the following publication:

S. L. Phung, A. Bouzerdoum, and D. Chai, "Skin segmentation using color pixel classification: Analysis and comparison," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 27, no. 1, pp. 148-154, January 2005.

4. Usage

The database has been used by:

National Tsing-Hua University (Taiwan), Microsoft Research, University of Bradford (UK), University of Toronto (Canada), Nanyang Technological University (Signapore), Otto-von-Guericke University (Germany), Monash University (Australia), National Taiwan University (Taiwan), State University of Campinas (Brazil), Axis Communications AB (Sweden), National University of Sciences and Technology (Pakistan), Dartmouth College (USA), Danang University of Sciences and Technologies (Vietnam), Universiti Teknologi Malaysia (Malaysia), Fudan University (China), Silesian University of Technology (Poland).

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