Hyperspectral/multispectral/near-infrared face databases:
A presentation of some examples

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1. Introduction

[…] so far there is not a large-scale NIR face database which is publicly available. There is a high demand to construct an open NIR FR database, on which the researchers can test and compare their algorithms.

Baochang Zhang, Lei Zhang, David Zhang, Linlin Shen, Directional binary code with application to PolyU near-infrared face database, Pattern Recognition Letters, Volume 31, Issue 14, **15 October 2010**

2. Three database examples

- Four examples
  - 2 hyperspectral
  - 1 multispectral
  - 1 near infrared
- Only multispectral one is available on-line
  - Is hardly useful

2.1 Hyperspectral, by Stefan A. Robila

- Motivation: demonstrate “extra” info can outperform RGB image based recognition
- Camera: Surface Optics 700
- DB features:

Type	Specter	Band size	Number of images	Subjects	Pose/ expression variations?	Illumination variations
Hyperspectral	0.4-0.9 μm	5 nm	45	9	Yes	Daylight

2.2 Hyperspectral, by Louis J. Denes

- Motivation: build face database for multiple uses
- Indoors, with different custom light setups
- DB features:

Type	Specter	Band size	Number of images	Subjects	Pose/ expression variations?	Illumination variations
Hyperspectral	0.45-0.11 μm	10 nm	216	54	No	Halogen (4 setups)

- ¡! Caused eye irritation to subjects (due to too powerful lamps)

2.3 Multispectral, by H. Chang

- Motivation: demonstrate hyperspectral info is useful overcoming illuminaton variations
- 25 bands in RGB sope, plus long-wave infrared
- DB features:

Type	Specter	Band size	Number of images	Subjects	Pose/ expression variations?	Illumination variations
Multispectral	0.48-0.72, 8-12 μm	9.6 nm (RGB)	2624	82	Yes	Daylight, halogen, 2 fluorescents

2.4 PolyU-NIRFD

- Infrared pictures
- Article not yet published (Pattern Recognition Letters)
- Database not yet available
- DB features:

Type	Specter	Number of images	Subjects	Pose/ expression variations?	Illumination variations
Near-infrared	0.78-1.1 μm	35000	350	Yes, expr., pose and scale	No

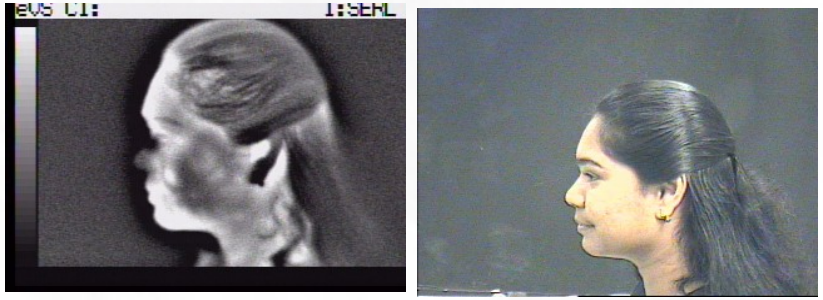
2.3 Multispectral, by H. Chang

- What's available on-line:
  - 8397 images
  - 31 subjects
  - RGB images are already fused
  - Some subjects more illumination variations than others

2.3 Multispectral, by H. Chang

- Illumination variations

- Expression variations



- All the sets include frontal images taken from different angles (180º around the face)

3. Conclusion

- The only DB available from these 3 is multispectral and has RGB bands fused → Not useful
- Need of developing a new database
- Viewed examples are useful for:
  - Establishing design guidelines
  - Avoiding mistakes
  - Knowing the scope of previous works