

Combining Soft Biometrics to Describe Person Appearance

Niyati Chhaya
CMSC 601 Spring 2011

April 20, 2011

Introduction

Overview

Data Collection

Relating Features

Conclusion

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9-11 2001

[Person Finder: 2011 Japan Earthquake](#)

日本語 | English | 日本語 | 中文(简体) | 中文(繁體) | Português(Brasil) | español

What is your situation?

[I'm looking for someone](#)

[I have information about someone](#)

Currently tracking about 259800 records.

短縮 / Short URL: <http://goo.gl/sagqs> (携帯対応 / Mobile OK)

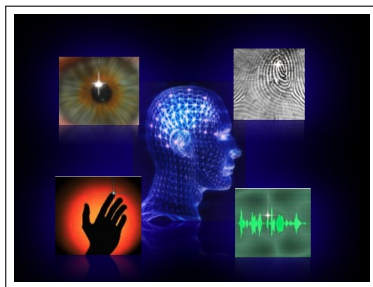
[災害に関する情報 / Other Resources](#)

NHK 災害情報も含みます / with data from: NHK

PLEASE NOTE: All data entered will be available to the public and viewable and usable by anyone. Google does not review or verify the accuracy of this data.

Japan 2011

Soft Biometrics



Biometric features - Define human identity

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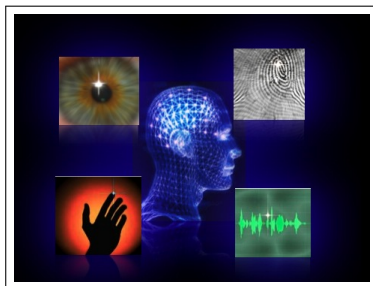
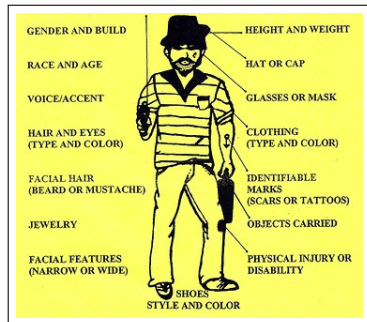
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Soft Biometrics



Biometric features - Define human identity

Soft Biometrics: Features that describe person appearance but are not unique to that person. [Jain et al, 2004]

Aim 1

Extracting multiple soft biometrics to describe person appearance

Related Work

- ▶ Multibiometrics fusion [Nandakumar et al, 2005]
- ▶ Biometrics + soft biometrics [Jain et al, 2004]
- ▶ Bag of soft biometrics for person identification [Dantcheva et al, 2011]

Related Work

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- ▶ Biometrics + soft biometrics [Jain et al, 2004]
- ▶ Bag of soft biometrics for person identification [Dantcheva et al, 2011]
 - ▶ Combining face features with weight estimation and clothing information
 - ▶ Pairwise correlation to identify co-occurrence of different values
 - ▶ Domain values of features are very coarsely defined (Skin color: Type 1, Type 2, Type 3)
 - ▶ Depends on the data for categories of authentication
 - ▶ Data distribution and size must be known

Related Work

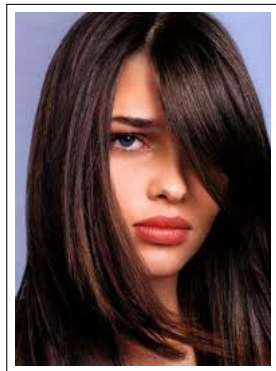
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Feature detectors are perfect

Relating Features

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Gender: Female
Facial Hair: Present

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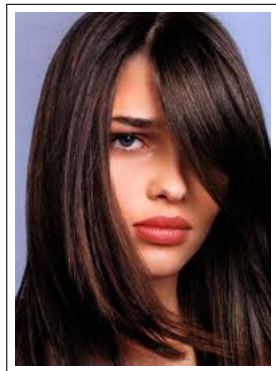
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Relating Features



Gender: Female

Facial Hair: Present

Need to identify and establish communication between different features using their mutual dependencies

Aim:2

Designing a way to relate different features using a probabilistic graphical model

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Example HIT


Describe the appearance of the person
Requester: Niyati Chhaya
Qualifications Required: HIT approval rate (%) is not less than 92
Reward: 90-02 per HIT
HITs Available: 300
Duration: 10 minutes

Describe the Person in this Image

Provide identifying information for the person in the image. The description should look like a missing person report for the subject.

Instructions:

- Give values about the following features of the person in the image.
- Give any other important identifying information in the space provided for other information.

	Identifiable Marks <input type="text" value="None"/>	
	Eyeglasses <input type="text" value="Present"/>	Describe (Golden rim, Sunglasses, etc.)
	Clothes <input type="text" value=""/>	Type of Shoes
	Jewelry <input type="text" value=""/>	Describe (Pearl necklace, Long earrings, etc.)
	Head gear (Cap, Scarf, etc.) <input type="text" value=""/>	Describe (Blue Turban, Baseball cap, etc.)

Results

HIT ID	Worker ID	Lifetime Approval Rate	Input Image URL	Its	Comment	Fh	Fc	Jc	Sc	Age	S	Ec
200A0YNL82N0038EDJFVHTDZ944	A30CYMOL013309	93% (211028)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Black		Dark (Brown)			Black
200A0YNL82N0038EDJFVHTDZ944	A1XG0782N71ND	88% (1330)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut	he is waiting for game	Present	Black	His hair is above head	Dark (Brown)	clean mustache	he is a player he is leaving a sports dresshe ...	Black
200A0YNL82N0038EDJFVHTDZ944	A2F5FVHMFR3M	100% (1878)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Brown	Very short	Light (Light silver/brun)		(Not visible)	Other
200AUNL2ERJ8ECDDJQVFWJ8J	A30CYMOL013309	93% (211028)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Other		Light Intermediate (Dark silver/brun)			Hazel
200AUNL2ERJ8ECDDJQVFWJ8J	A28A9YUJUN8A	100% (96)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut	no glasses	Absent	Brown	alto	Dark (Brown)			Brown
200AUNL2ERJ8ECDDJQVFWJ8J	A16JUCDDHG65	100% (11)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Other	sliding up	Dark (Brown)			Brown
200AUNL2ERJ8ECDDJQVFWJ8J	A1U7RW3MLHGR	100% (6646)	http://www.ca.umbc.edu/~nyetc1/database/193_21...	Long (beyond shoulder length)		Absent	Brown	In a ponytail	Very Light			Blue
200AUNL2ERJ8ECDDJQVFWJ8J	A30CYMOL013309	93% (211028)	http://www.ca.umbc.edu/~nyetc1/database/193_21...	Intermediate (beyond ear length to shoulder len...		Absent	Brown		Very Light			Black
200AUNL2ERJ8ECDDJQVFWJ8J	A10BNAC085W6V	76% (3890)	http://www.ca.umbc.edu/~nyetc1/database/193_21...	Shoulder length	female droll in pants and a blue shirt, camp...	Absent	Brown	Hair is pulled back and is difficult to detarn...	Very Light			Blue
200UNL2B97H0TVGZJ8VJF0PDL5H	AXKU160WYMET	88% (7381)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Intermediate (beyond ear length to shoulder len...		Absent	Brown		Light (Light silver/brun)			Brown
200UNL2B97H0TVGZJ8VJF0PDL5H	A3F5FVHMFR3M	100% (1878)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Brown	Wearing glasses, big ears	Light (Light silver/brun)		(Not visible)	Other
200UNL2B97H0TVGZJ8VJF0PDL5H	A30CYMOL013309	93% (211028)	http://www.ca.umbc.edu/~nyetc1/database/93_...	Short/Crew cut		Absent	Brown		Light (Light silver)		(NOT SEEN)	Other

Data Collection

To be completed

- ▶ Clean data
- ▶ Visualize
- ▶ Extract mutual occurrences

Data Collection

To be completed

- ▶ Clean data
- ▶ Visualize
- ▶ Extract mutual occurrences

Evaluation

- ▶ How consistent is the data?
- ▶ Time and Effort for data gathering?
- ▶ What data is related? How strongly is it related?
- ▶ Amazon MTurk: Acceptance rate/ Rejection rate:
Comparing these numbers w.r.t. the features

Relating Features

To be completed

- ▶ Validate graphical structure
- ▶ Learn edges and weights from related data
- ▶ Identify convergence

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To be completed

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Evaluation

- ▶ Graph structure
- ▶ Efficiency of the potential functions

Summary

- ▶ Data collection using Amazon Mechanical Turk
- ▶ Probabilistic graphical structure to define relationships between different soft biometrics
- ▶ Potential functions to define communication between features

Thank you !
Questions ?