



What's gait recognition?

Human Identification: rely on database

- Face Recognition
- Fingerprint Identification
- Iris Recognition
- Palm Recognition
- Gait Recognition**

- Long-range identification
- Low-resolution image

歩き方で個人認証
阪大不審者監視に応用へ

日本経済新聞
大阪大学の八木教授は、映像から人のシルエットを切り出し、頭、顔、腕などからなる歩きの姿勢を特徴として、個人認証できる技術を開発した。体つきの違いや、手の振り方など歩き方に個人差があることを突き止めた。防犯カメラに組み合わせて、不審者を監視するシステムを三〜五年以内に実用化を目指す。詳細については個人認証できるため、例えばオーストラリアの広い範囲でも監視できる利点がある。社内

How to get gait?

Tracking

- Background Subtraction
- Particle Filter
- Template
- Mean Shift
- Innovation
- Segmentation
- Clustering: Background Subtraction
- Filtering
- Template
- Graph cuts

The most common used Background subtraction

- Human is moving
- Camera is moving: dynamic & multi-level background

Research proposal:
Combine Mean Shift tracking and Graph cuts segmentation

Input image

Background data term

Foreground data term

X smoothness term

Y smoothness term

Time smoothness term

Trimap

Segmentation result

silhouette

Open ground

Experimental results prove:

- Stable in dynamic and multi-level background
- Adaptive to the pedestrian's size
- Anti-interference: seldom includes non-foreground information

(Features)

(a) (b) (c)

Rainway station

Contribution

- In theory, innovatively combine Mean Shift and Graph cuts together;
- In actualization, implement the new algorithm into useful program;
- Further, generate a image database for gait recognition.

Challenges

- Close background or parts share the color with the pedestrian;
- The pedestrian is blocked by others;
- The pedestrian is carrying bags.

Future work

- Optimize algorithm: improve accuracy;
- Pedestrian detection: full automatic;
- Gait recognition: practical application.

Automatic human identification