

3D

1, 2, 3
1 2 3

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3D Game Control using Gesture Recognition

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3
LDA
가
3

Keyword : Gesture Recognition, Marker-free Motion Capture, 3D Game

1. [3]

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[4]

[4]

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[1][2], Visual Hull Carving

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2.

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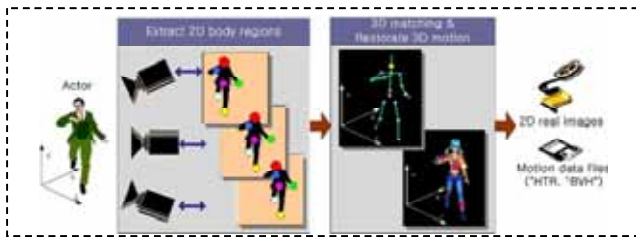
2

3

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3 가

1



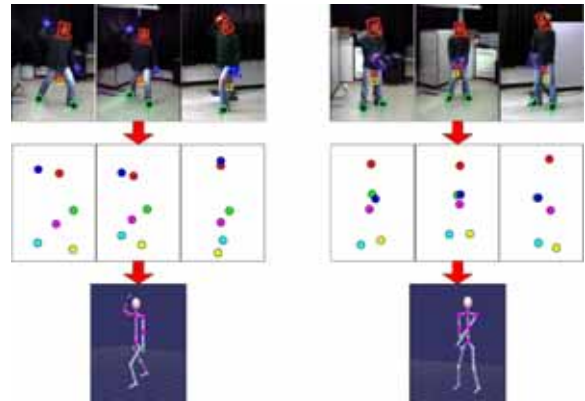
<3D Motion Capture>



<3D Game Application>

Motion & Gesture Recognition

<Recognition>



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2. 3

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(HTR)

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3.

[5]

3.

(Linear Discriminant Analysis)[6]

LDA

Analysis)

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PCA(Principal Component

scatter matrix(S_B) within-class scatter matrix(S_W)

(W_{opt})

LDA

$$W_{opt} = \arg \max_W \frac{|W^T S_B W|}{|W^T S_W W|} = [w_1 \ w_2 \ \dots \ w_m] \quad (1)$$

(1) S_B S_W

$$S_B = \sum_{i=1}^c N_i (\mu_i - \bar{\mu})(\mu_i - \bar{\mu})^T \quad (2)$$

$$S_W = \sum_{i=1}^c \sum_{x_k \in X_i} (x_k - \mu_i)(x_k - \mu_i)^T \quad (3)$$

X_i

, μ_i

X_i

mean

. c

, N_i

within-class scatter matrix

between-class scatter matrix

(1) , Small Sample Size(SSS) [7]

11

HTR

23

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Mahalanobis

LDA Distance

(5)

($f(g_s)$)

$$f(g_s) = (g_s - \bar{g})^T S_g^{-1} (g_s - \bar{g}) \quad (4)$$

S_g

, \bar{g}

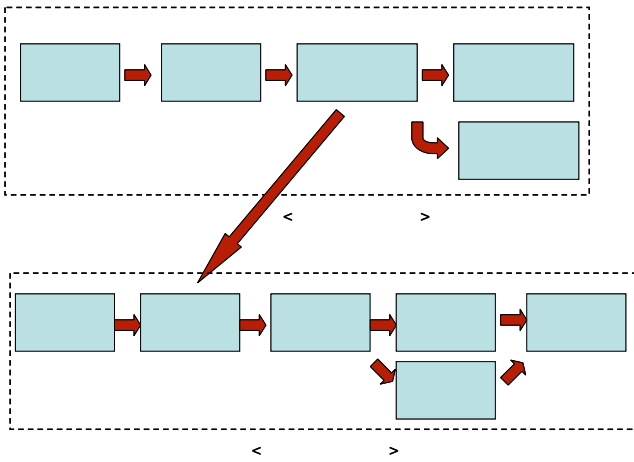
between-class

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2 가 , 3

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5.

99.75%

1 30

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7

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7.

11

98.75%

17722

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가 3

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6.

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