

## Recent Research Trend of Gesture-based User Interfaces

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(Gesture)

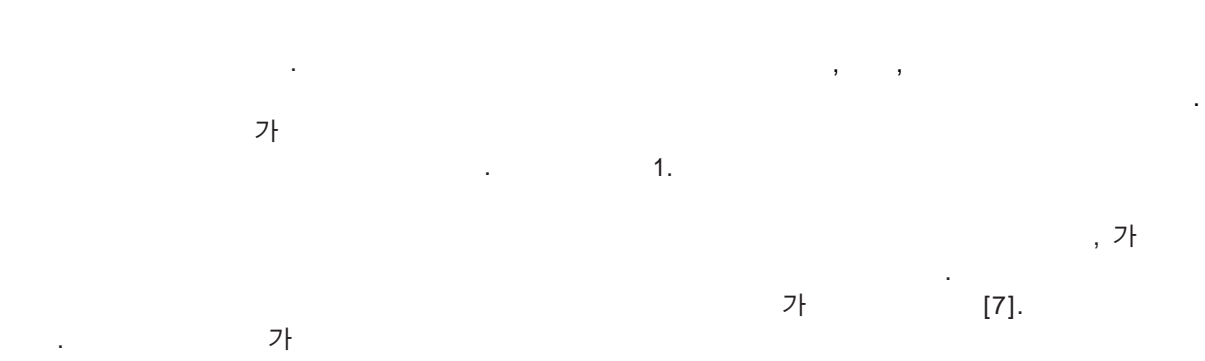
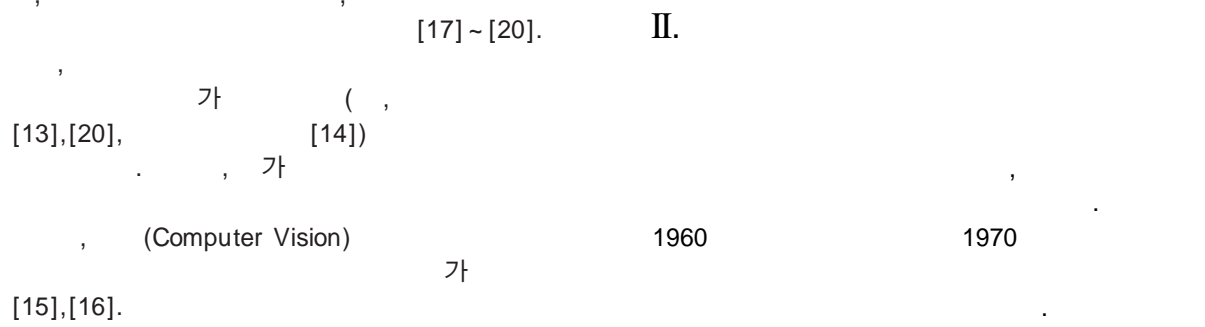
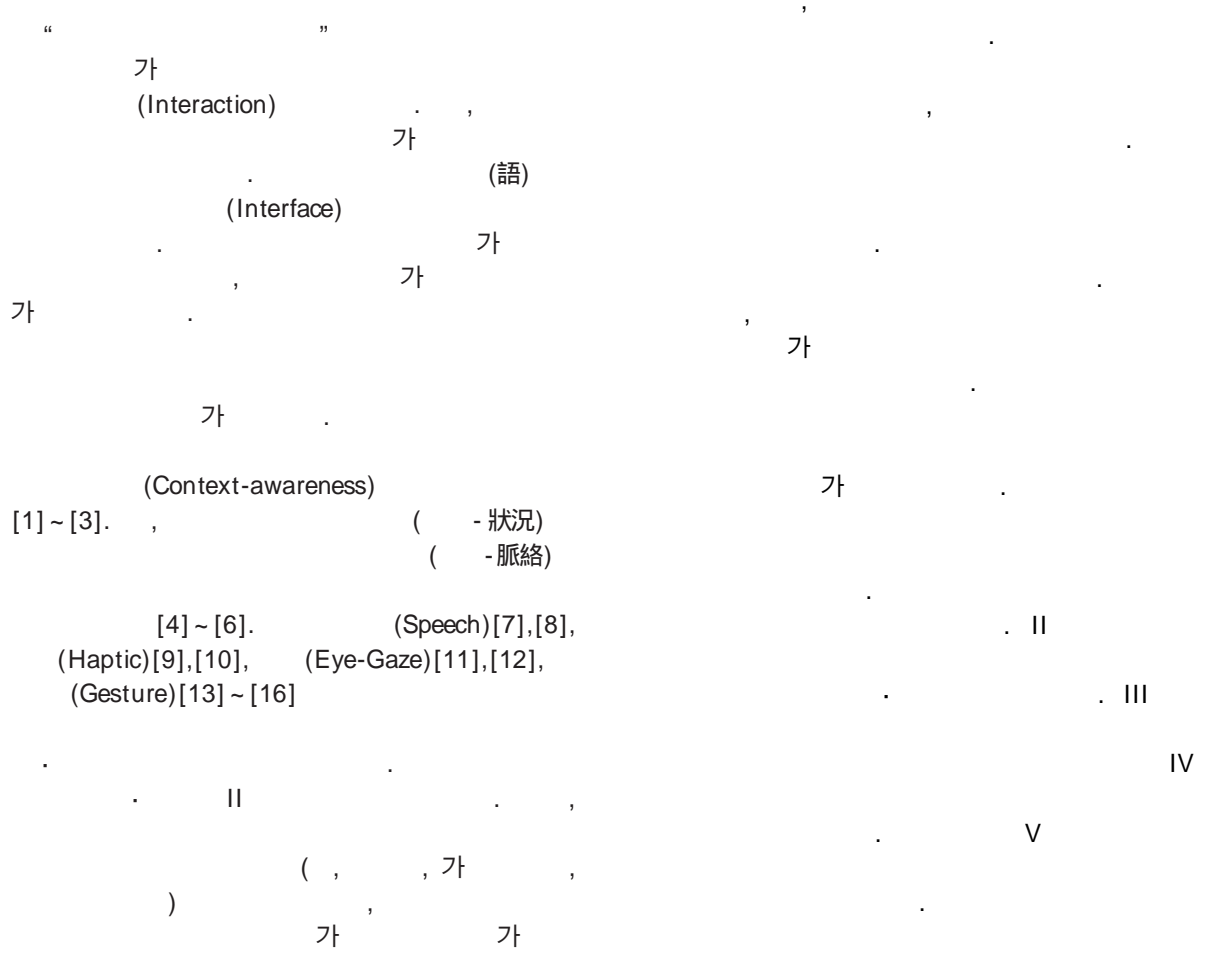
(Multi-modal)

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In this paper, we review recent research trends in gesture-based user interfaces to support natural user interactions with media contents. With the developments of information and communication technology, users are able to enjoy various media contents through various devices anytime and anywhere. From the perspective of user interactions, however, we still suffer from unnatural user interfaces and learning phase of new user interfaces on the various types of media contents and devices. Thus, to support more natural and comfortable user interfaces, there have been many research activities on the development of gesture-based user interfaces. The gesture-based user interface is relatively intuitive and simple in comparison with other user interfaces, such as speech, haptics and eye-gaze, so that it can support more natural user interactions. In particular, the gesture-based user interface is more effective on mobile devices due to its intuitiveness and simplicity. Therefore, we believe personalized gesture-based user interface is required to support user-centered multi-modal interactions in ubiquitous computing environment.

Keywords: User Interface, Gesture-based Interface, Context-awareness, UbiComp, Augmented Reality

I.



1.

	• • ,	• • ( )	• - • • -
	• , , 가 • ,	• 가 •	• ( , ) , • , , ( )
	• ,	• •	•
	• 3 가 • 가 •	• 가 •	• , ,

(VUI: Voice User Interface)  
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[8].

2.

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(Threshold Value)

(Haptic)

4.

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가

[9].

(collision detection),  
(contact impedance), (shape  
representation), (surface friction),  
(dynamics), (surface  
curvature), (texture modeling),  
(physical constraints)

[13] ~ [16].

가 2 3

(1KHz)

1

(~ 30Hz)

[10].

1

3.

(Eye-Gaze)

가

[11],[12].



(가) <sup>1)</sup>(5DT Inc. Data Glove 14 Ultra)



( ) <sup>2)</sup>(Polhemus Fastrak )

1.

### III.

#### II

가

(Data Glove)[13],[21]  
(Motion Tracker)[14] 1

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가 가  
[13],[21].

가 [20]. 가

(Marker)  
(Markerless)

가  
(Calibration)

2.

1.

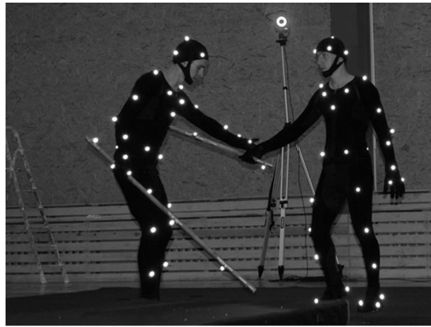
가 가 가

(Tracking), (Initialization),  
(Recognition) (Pose Estimation)  
(Calibration)

가

3 , 3 가

1) <http://www.5dt.com/>  
2) <http://www.polhemus.com/>



(가) 3)



( ) [25]<sup>4)</sup>

2.

(Marker) (Optical Flow)[16],[17],  
 (Background Subtraction)[26]~[28],  
 (Motion History Image)[29],[30]

가 SSD(Sum of Squared Difference)

[14]. ( , , ) 가

(Active) (Passive)

LED ) ( , LED, [22],[23]. (Uniform) (Motion Energy Image)

[24],[25].

가 가 , 가

2 가

(Markerless) 3

가 가 (Occlusion)

[31]~[35].

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3) <http://www.mocap.it/>



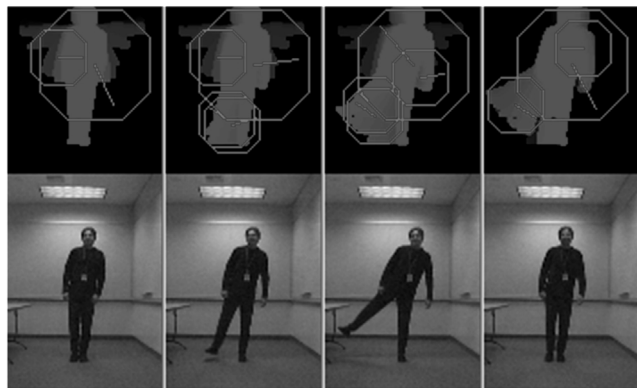
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[17]



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[26]



( )

[30]

3.

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[36].

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#### IV.

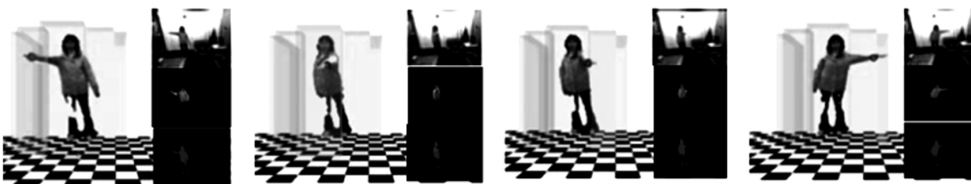
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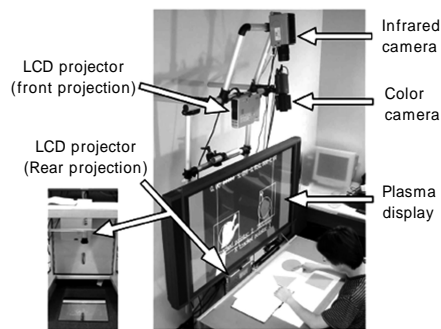
(가) 2

[31]

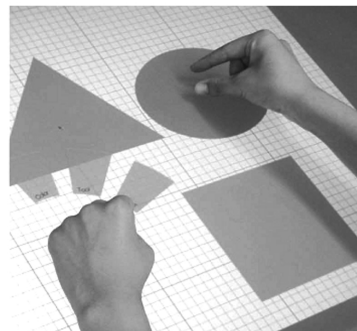


( ) -

[33]



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[34]

4.

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, 가 , GPS(Global Positioning System)

4)

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( , , )

5

[19],[37],[38].

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4) <http://support.apple.com/kb/HT1636>



(가)

[19]



( )가

[38]

5.

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(Augmented Reality:

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[39].

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V.

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