3D Gestural Interaction to Handle Multimedia Ambient Environment

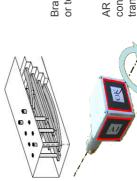**Muhammad Tahir, Eric Lecolinet {tahir,elc@enst.fr} ENST Paris**

Overall Research Objective:

Controlling variety of multimedia devices together.

Research Problem:

Management of large amount of data as a list of hundreds of TV channels, the list of favorite songs and variety of basic functionality offered by these devices, in a fluid and natural way.

Technologies used:
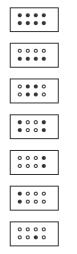
Tactile Technology:

Braille Cell consists of number of different pins which alone or together act as a tactile feedback.

Augmented Reality (AR) Technology:

AR technology uses special devices (ARMarkers) which contain patterns on it and are detected by webcam. The translational and rotational movements of ARMarkers helps to solve different problems.

First Solution: Tactile Interaction

The tactile interaction deals with the sense of pressure on the skin. Braille cell is one example which provides such feedback. It consists of different pins. The combination of these pins represent different patterns which further give required information.
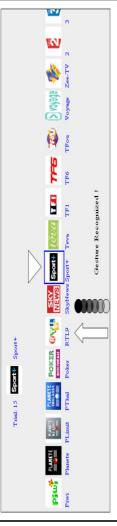
- ● Pins up
- ○ Pins down

Tactimote:

Tactimote, a remote control with tactile feedback designed for navigating in long lists and catalogues. Tactimote integrates a joystick that allows 2D interaction with the thumb and a Braille cell that provides tactile feedback. This feedback is intended to help the selection task in novice mode and to allow for fast eyes-free navigation among favorite items in expert mode.

Joystick
Braille cells
Trigger button

Second Solution: 3D Gestural Interaction

For multimedia data manipulation as a list, we use two techniques: Circular Scrolling and Circular Scrolling with Crossing

Trial: 15   Sport+

Gesture Recognized !

Circular Scrolling:

List is scrolled by ARMarker's clockwise and counter clockwise rotation. The rotation angle controls the speed of the list. The user scrolls the list and brings the target in the box. To select the item user performs the 3D vertical gesture.

Circular Scrolling with Crossing:

The user scrolls the list by rotating the marker. In this case there is no need to bring the target in the box. As soon as the target is visible, the user draws a cross on the target to select it.

Trial: 5   SkyNews

Being in the ambient state:

The use of the ARToolkit and *Tactimote* may provide the user a "*semi-presence*" state because during navigation and selection the user's perception and the responses become fluid enough to give him/her a feel of "being in the ambient state". The results of informal tests confirm the suitability of our techniques.

Conclusion and Future Work:

3D Gestural Interaction techniques provide software solution while Tactimote as tactile interaction provides the combination of software and hardware solution. We plan to explore different arrangement of pin patterns for hierarchical lists. Finally, we would like to compare the efficiency our system both with traditional remote controls.