SAPIENZA
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Report on a project
for Human-Robot Interaction course

Paper: “Personalized short-term multi-modal interaction for social robots assisting users in shopping malls”

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The paper “Personalized short-term multi-modal interaction for social robots assisting users in shopping malls” is focused on customized interactions between robots and humans. To effectively assist shopping malls visitors, a social humanoid robot Pepper identifies the individuals it interacts with to offer personalized assistance. Through implemented modalities in the project, Pepper robot can provide help to the visitors by indicating directions, displaying advertisements, and presenting a list of shops for visitors. While the range of assistance can become more sophisticated, the project's goal is to show a possible approach for personalizing the Pepper robot's assistance.

To offer personalized assistance, the robot needs visitors to provide pin codes. The pin can be manually entered by the visitor or by someone nearby through Pepper’s touch screen and alternatively, it can be automated through the scanning of a QR code or the use of an embedded chip.

Thus, there are five visitor categories:

Categories of visitors	**Pin codes**
A. Visitor with deafness	1111
B. Visitor with blindness	2222
C. Elderly visitor	3333
D. Adult visitors without deafness, blindness, or being elderly	4444
E. Visitors attempting to provide an incorrect pin without having a valid one	xxxx

Following the execution of a ‘Welcome’ page, a ‘Do you need help?’ page with ‘Yes’ and ‘No’ buttons will appear. The visitor can either click on the buttons or verbally express their agreement or disagreement to the robot.

In the case of an affirmative response, the robot will present options for the visitor to choose, including buttons for ‘Direction’, ‘Advertisement’, and ‘Shops’. The latter two options do not require a pin code; they are straightforward.

Direction option

Choosing the ‘Direction’ option triggers the loading of pin.html in hri.py. The program reads the input and assigns a value to the action based on the visitor’s input. If the entered pin does not fall into any of the first four categories of visitors, an ‘Access denied’ window is displayed. If the pin is correct, the program loads the slide.html template by executing the corresponding action. After a brief period, the ‘Goodbye’ page is presented, and the program returns to the ‘Welcome’ page.

Advertisement and Shops options

Regarding the ‘Advertisement’ option, an embedded frame will display video advertisements. As for the ‘Shops’ option, the robot will present a list of shops within the mall.

Personalized actions for first four visitor categories are as follows:

A. For individuals with deafness, the action exclusively displays images and texts without any spoken output.
B. For individuals with blindness, the action solely delivers spoken information.
C. If the visitor is elderly, the action presents larger texts and also provides spoken output.
D. For individuals without deafness, blindness, or being elderly, the action displays standard-sized text and delivers spoken information.

A and D:

The visual representations of directions for categories A and D will be the same, with the exception that category A does not include a spoken option.

Direction

> 100m | ^ 20m | < 50m

B:

Category B exclusively features spoken options, with no accompanying texts or maps.

C:

In category C, the texts are presented in a larger and more comprehensible format, and spoken assistance is also provided.

DIRECTION

TURN TO LEFT AND WALK 100 METERS | TURN TO LEFT AND WALK 20 METERS | TURN TO RIGHT AND WALK 20 METERS