

Visual, Auditory and Haptic Navigation Feedbacks among Older Pedestrians

【Summary】:

This study aimed to compare visual, auditory and tactile guidance feedback for older pedestrians and consider their navigation performance and user experience. Use virtual environments to measure time to arrival and speed of correct response.

【Experiments】:

Participant:

Three groups of participants were compared in order to highlight possible age-related difference: 16 middle-age adults (M=58.3, SD=8.7; 9 women, 7 men) who still had a professional activity, 21 younger-old adults (M=66.7, SD=7.6; 8 women, 13 men), and 21 older-old adults (M=75.9, SD=7.5; 10 women, 11 men) who were all retired.

Procedure:

4 feedback modes:

An A3 paper map

Visual guidance feedbacks

Auditory guidance feedbacks

Haptic guidance feedbacks

Record Data:

Route duration was measured, as the time between when the participant first moved the joystick to start walking and the end of the route. On this basis, the difference between the route duration and the optimal time to reach the destination was calculated, as the routes were not exactly identical. The percentage of correct responses at intersections was also calculated. The interviews were recorded and verbatim were fully transcribed, according to the ten UX dimensions shaping the interview. On this basis, percentages of responses for each UX dimensions were calculated.

Results:

TIME TO REACH DESTINATION

CORRECT RESPONSES AT INTERSECTIONS

User experience

【Conclusion】:

With maps, older participants make more mistakes and tend to take longer to reach their destination.

These results highlight the benefits of using navigation tools instead of maps for older people. Older participants also had poorer navigation performance. These findings suggest that visual or audio guidance systems may be better suited to the needs of older people than tactile guidance systems.



Is the guidance?	Visual	Auditory	Haptic	Map
Pleasant	93% (55)	79% (56)	50% (56)	62% (52)
Perceptible	100% (48)	84% (56)	22% (58)	64% (58)
Understandable	95% (56)	86% (57)	41% (58)	39% (36)
Compatible with paying attention	79% (48)	65% (49)	69% (49)	45% (51)
Disorientating	2% (58)	7% (58)	12% (58)	30% (58)
Reassuring	81% (42)	91% (43)	73% (37)	68% (41)
Fostering autonomy	84% (51)	74% (46)	59% (46)	66% (44)
Useful	80% (56)	83% (57)	73% (58)	93% (43)
Innovative	77% (53)	86% (51)	83% (52)	6% (48)

Is the guidance?	Visual	Auditory	Haptic	Map
Habitual	78% (58)	43% (58)	43% (58)	70% (56)