Pedestrian collision avoidance on narrow sidewalk: a meeting between psychology and virtual reality
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To cite this version:
Cléo Deroo, Angélique Montuwy, Béatrice Degraeve, Jean-Michel Auberlet, Anne-Hélène Olivier, et al.. Pedestrian collision avoidance on narrow sidewalk: a meeting between psychology and virtual reality. TRB 2019 - Annual Meeting on Transportation Research Board, Jan 2019, Washington, United States. hal-02396553

HAL Id: hal-02396553
https://univ-rennes.hal.science/hal-02396553
Submitted on 31 Jan 2020

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PEDESTRIAN COLLISION AVOIDANCE ON NARROW SIDEWALK: A MEETING BETWEEN PSYCHOLOGY AND VIRTUAL REALITY

Context: NARROW SIDEWALKS

Goal: to simulate a social virtual pedestrian (non player character) in order to study this kind of situation in virtual environment

Problem: why do we choose to step down or stay on the narrow sidewalk when we encounter a pedestrian walking in the opposite way?

Impact of 3 personal factors were studied

- Speed (fast – slow)
- Sex (Male – Female)
- Distraction (texting – non texting)

First Experiment – Questionnaire

- 64 videos of pre-jousting, before any modification of trajectory
- 64 videos of complete jousting with the new model

Social Perception Model

- Speed and attention influence the decision to step down
- N.B.: the virtual pedestrian sees pedestrian in the public space, and detects him in the social space

For the participants,

- Influence of speed and attention
- For the participants, no gender effects

We avoid the collision by modifying our trajectory

First Experiment – Results

- Pedestrian is expected to step down when:
  - he walks fast
  - he is attentive

To keep a safety zone

To anticipate the collision

Second Experiment – Results

- Credibility of model-based videos and fake videos according to the subjects’ answers

Overall ranking of the model-based videos, Median = 4

Social Perception Model

- Speed and attention influence the decision to step down from the narrow sidewalk

Assumptions:

- speed and attention increase the detection time in the ORCA model.
- Detection time is then a score.

Discussion

- To use Social Pedestrian Non Player Characters in VR environment is feasible
- Needs to take into account the empowerment/authority