Pedestrian collision avoidance on narrow sidewalk: a meeting between psychology and virtual reality
Cléo Deroo, Angélique Montuwy, Béatrice Degraeve, Jean-Michel Auberlet, Anne-Hélène Olivier, Marie-Axelle Granie

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

- Encountering two pedestrians is impossible
- One has to step down and stay on the narrow sidewalk when we encounter a pedestrian walking in the opposite way.

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)

Social Perception Model
- Speed and attention influence the decision to step down
- Social Perception Model: Speed and attention increase the detection time
  - The virtual pedestrian sees pedestrian in public space, and detects him in the social space

First Experiment – Questionnaire
- 64 videos of pre-jousting, before any modification of trajectory
- 9 videos of counterbalanced videos
- Participants told who was to step down: pedestrian at left or at right in the jousting with a Likert scale
- Participants said why the virtual pedestrian stopped down (speed, sex, distraction) with Likert scales on 36 videos:
- 64 participants

Social Perception Model: Perception model for the virtual pedestrian
- Collision avoidance behaviors are a function of the walking speed, the attention, and the distraction

ORCA Model used:
- Different types of collision avoidance (anticipative, reactive)
- Collision avoidance behaviors are a function of the walking speed, the detection time

2nd Experiment – Results
- Need to take into account the empowerment/authority
- To use Social Pedestrian Non Player Characters in VR environment is feasible

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