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://hal-univ-rennes1.archives-ouvertes.fr/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**

- Pedestrians manage social interpersonal distances.
- encounter of two pedestrians is impossible?
- one has to step down and he is exposed to the road traffic?
- it can be seen as an URBAN JOUSTING.

**Problem:**

- why do we choose to step down or 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.

**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 from the narrow sidewalk.
- **Assumption:** speed and attention increase the detection time in the ORCA model.
- **Detection time is then a score:**
  \[ d = l - b \]

**Discussion**

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

**First Experiment – Results**

- 64 videos of pre-jousting, before any modification of trajectory.
- 48 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 stepped down (speed, sex, distraction) with Likert scales.
- All participants.

**Social Perception Model**

- Speed and attention influence the decision to step down.
- Pedestrian is expected to step down when:
  - he walks fast,
  - he is attentive.
- For the participants, no gender effects.

**Perception model for the virtual pedestrian**

- ORCA model used.
- different types of collision avoidance (anticipative, reactive).
- Collision avoidance behaviors are a function of the walking speed, the detection time.

**Second Experiment – Questionnaire**

- 5 videos of complete jousting with the new model.
- 5 videos of counterbalanced videos.
- One of 8 videos is a fake video (opposite of the model result).
- Participants said if the jousting is credible.
- All participants.

**Experiment – Results**

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

**Participant said why the virtual pedestrian stepped down (speed, sex, distraction) with Likert scales.**

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**Future work**

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**Acknowledgment**

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