Pedestrian collision avoidance on narrow sidewalk: a meeting between psychology and virtual reality
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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)

Persoal characteristics (psychological and physical)

First Experiment – Questionnaire

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

Influence of speed and attention

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

- For the participants, no gender effects

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

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

Collision avoidance behaviors simulation (Orca model)

Discussion

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

First Experiment – Results

- Participants told who was to step down: pedestrian at left or at right in the jousting space, and detects him in the social space

N.B.

- The virtual pedestrian sees pedestrian in the public space, and detects him in the social space

Social Perception Model

- Speed and attention influence the decision to step down

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

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

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- To use Social Pedestrian Non Player Characters in VR environment is feasible
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