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

First Experiment – Questionnaire
* 64 videos of pre-jousting, before any modification of trajectory
* 64 videos of complete jousting with the new model
* 64 videos of complete jousting with the opposite of the model result

To anticipate the collision

Personal characteristics (psychological and physical)

Personnel Perception Model
- Speed and attention influence the decision to step down
- Social Perception Model
- Speed and attention increase the detection time in the ORCA model. Detection time is then a score.
- Virtual pedestrian decides to step down if his detection time is greater than the other pedestrian involving in the jousting

Assumptions:
- He is attentive
- He walks fast
- For the participants, no gender effects

Experiment – Results
- Influence of speed and attention
- Pedestrian is expected to step down when:
  - He walks fast
  - He is attentive
- For the participants, no gender effects

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

Social Perception Model:
- Speed and attention influence the decision to step down from the narrow sidewalk
- Virtual pedestrian decides to step down if his detection time is greater than the other pedestrian involving in the jousting

N.B.: the virtual pedestrian sees pedestrian in the public space, and detects him in the social space

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

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

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