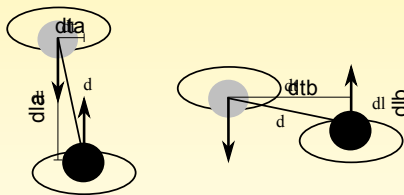




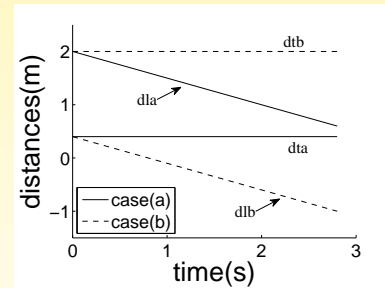
IDENTIFYING PEDESTRIAN INTERACTIONS IN CROWDS

Most data on interactions are obtained in experiments with very few pedestrians participating due to the difficulty in identifying these behaviours. This paper proposes a score that expresses the necessity of evasion between any number of pedestrians. It assumes that pedestrians will need to evade if their trajectories will lead to very short distances in a near future (short time-to-collision). The larger the score the higher is the probability that pedestrians are interacting.

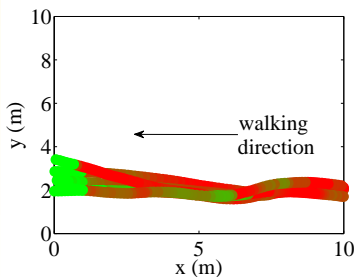
METHODOLOGY: The evasion score is calculated using the longitudinal and lateral distances between pedestrians over time (proximity scores) and the time available to apply the evasion manoeuvres (urgency score). The scores are implemented in a fuzzy logic algorithm with three membership functions: the "proximity memberships and the "urgency membership".



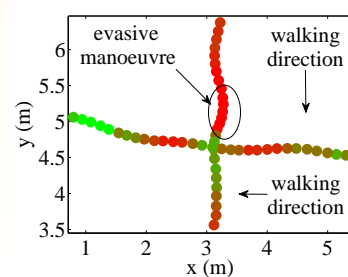
case (a) high evasion score case (b) low evasion score



RESULTS: Bidirectional and crossing flows presented good agreement between the values of the score with situations in which pedestrians are interacting. We found that 56% of all pedestrians in the bidirectional flow walked at least half of the corridor distance behind another pedestrian forming a lane. The average value of the score in these lanes was 0.52 with standard deviation equal to 0.22.



Five superimposed trajectories of pedestrians walking behind each other in lane. The colours represent the evasion score: red is a high score, light green is a low score.



Two crossing trajectories: the pedestrian walking from the top to the bottom applies an evasion manoeuvre in the downstream direction of the other pedestrian.