Supplemental Graphs

Stephen J. Guy et al. / PLEdestrians

Appendix B – Supplemental Images

I – Emergent Behavior

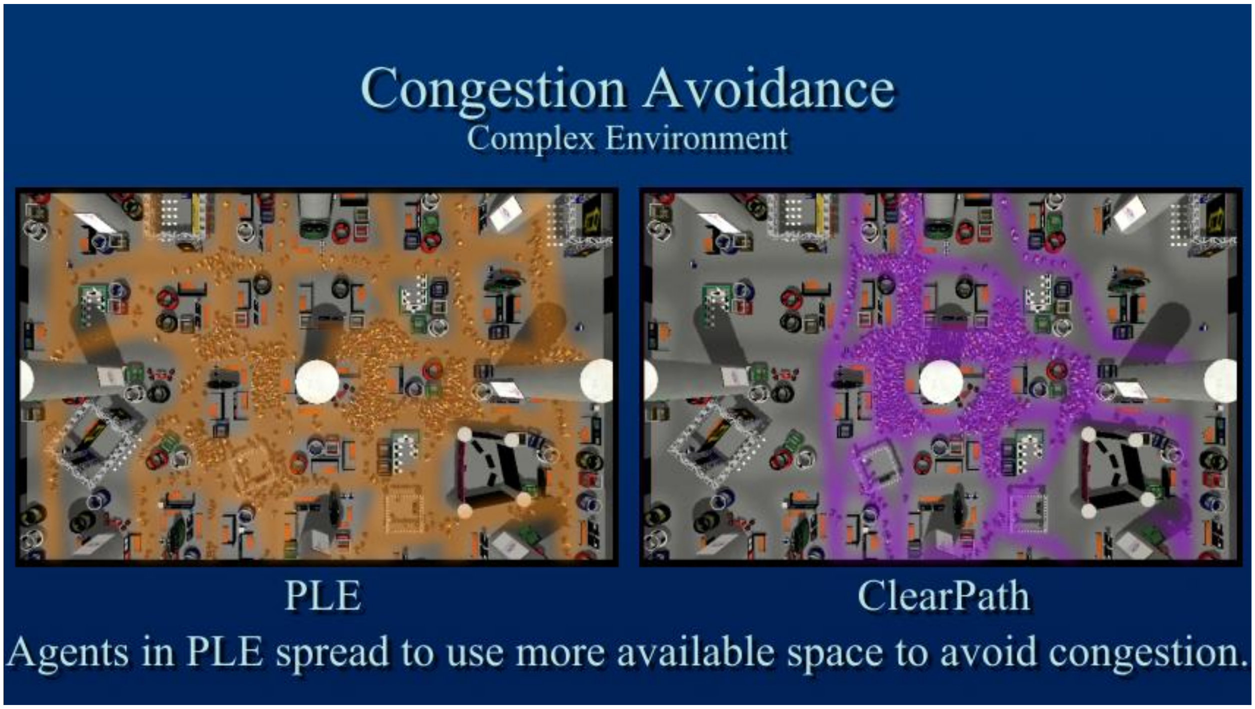


Figure 1 – Congestion Avoidance

Space highlighted shows flows generated by our PLEdestrian algorithm (left) and RVO-based algorithm (right). PLEdestrian algorithm avoids congestion and better utilizes the space to generate natural flows..

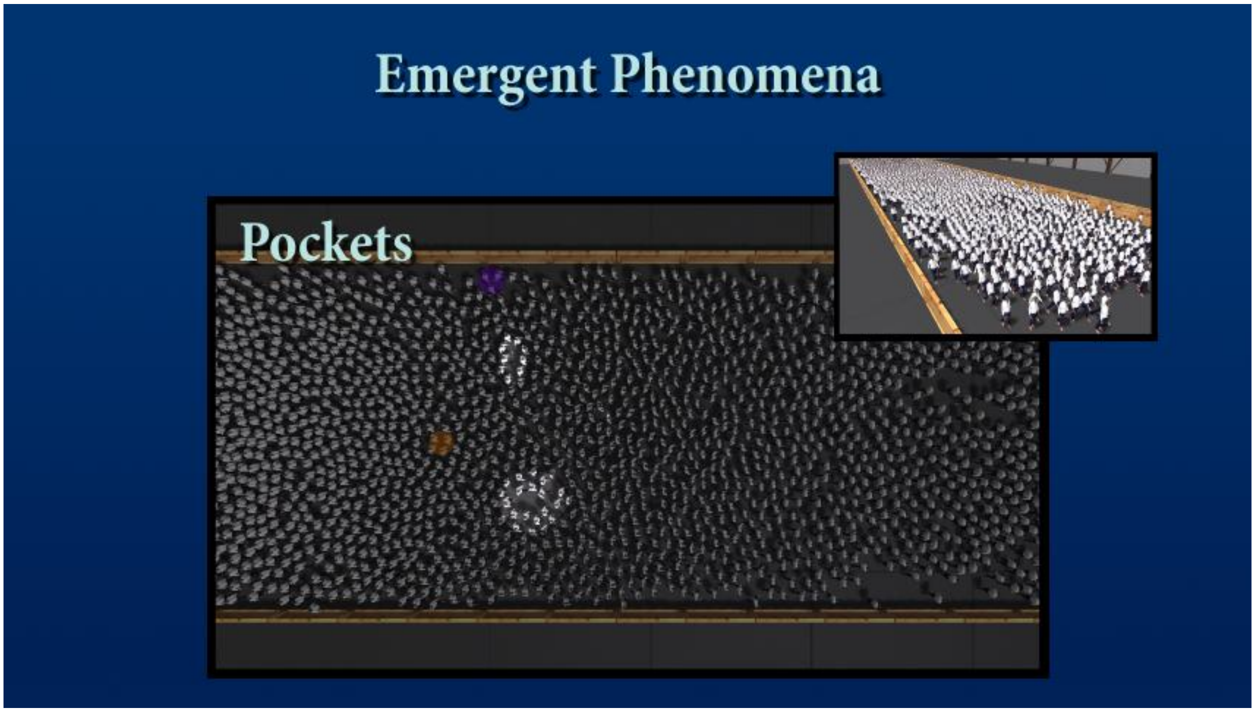


Figure 2 - Uneven Densities

Our PLEdestrian algorithm can automatically generate pockets of dense and sparse regions, as observed in real-world crowds.

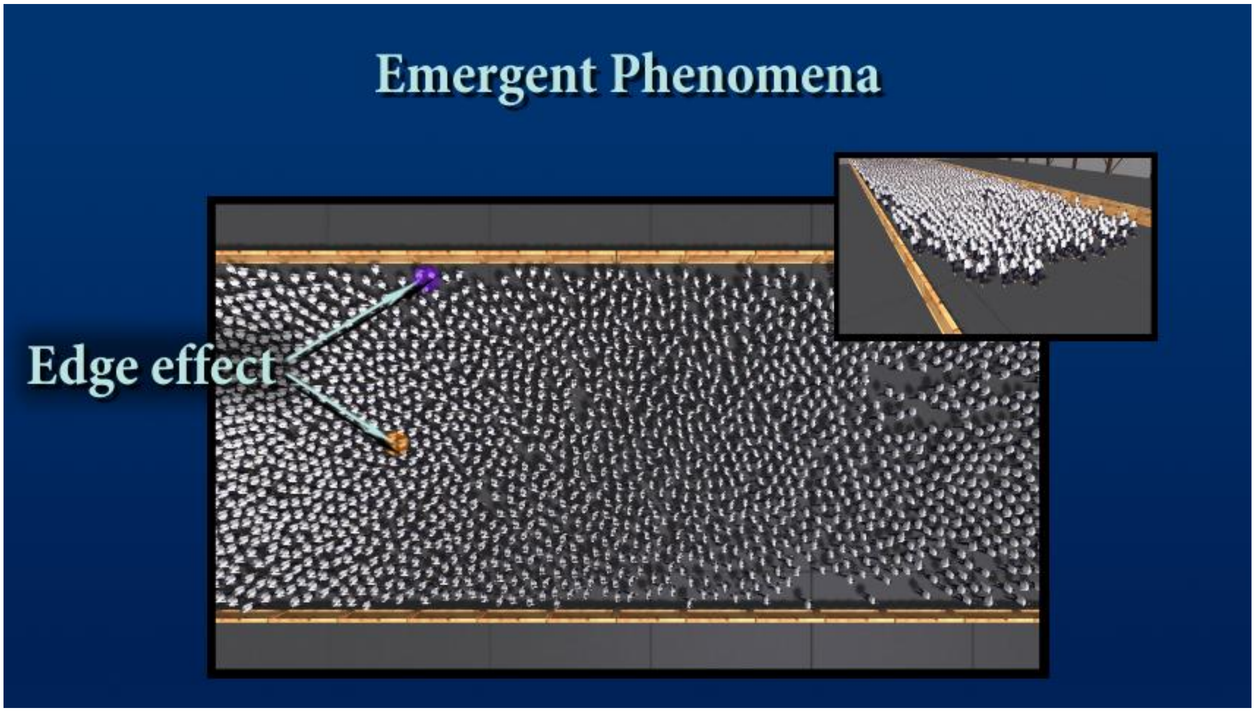


Figure 3 - Edge Effect

PLEdestrian algorithm can automatically edge effects. In general, the agents at the edge of the crowd move faster than those in the middle.

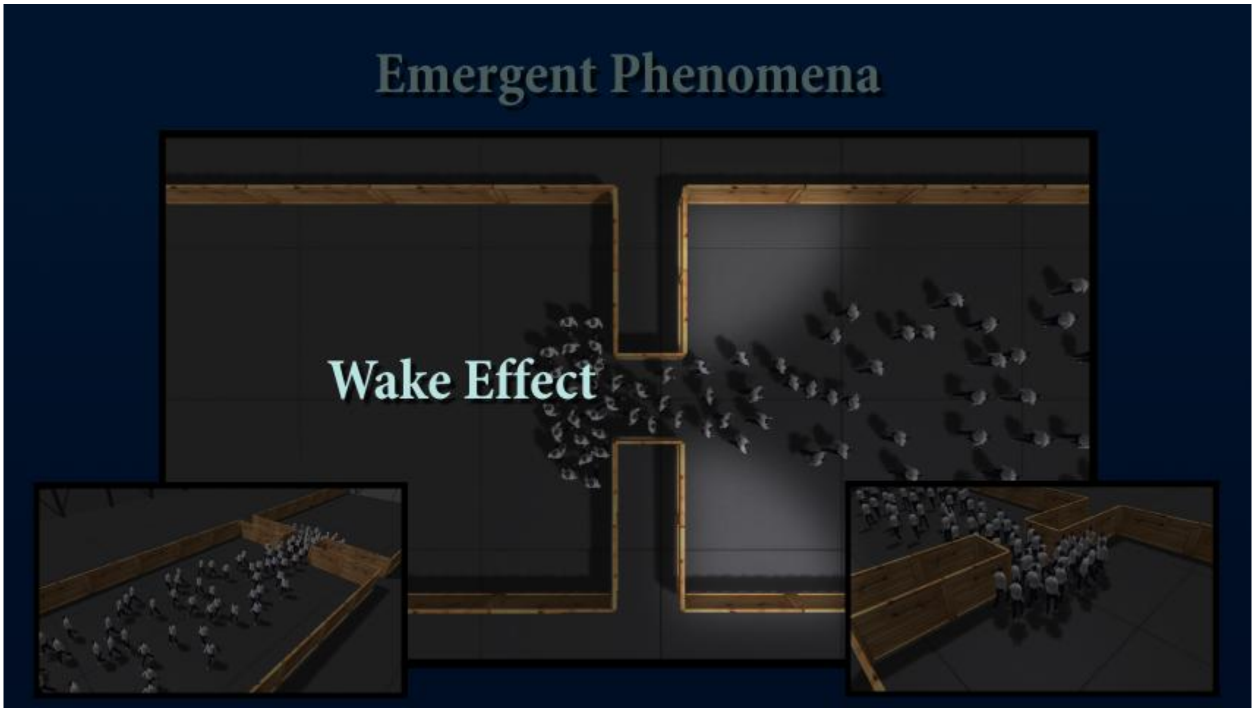


Figure 4 - Wake Effect

PLEdestrian algorithm can also generate wake effects, which arise when the agents don’t fill up the space after narrow passages or other obstacles.

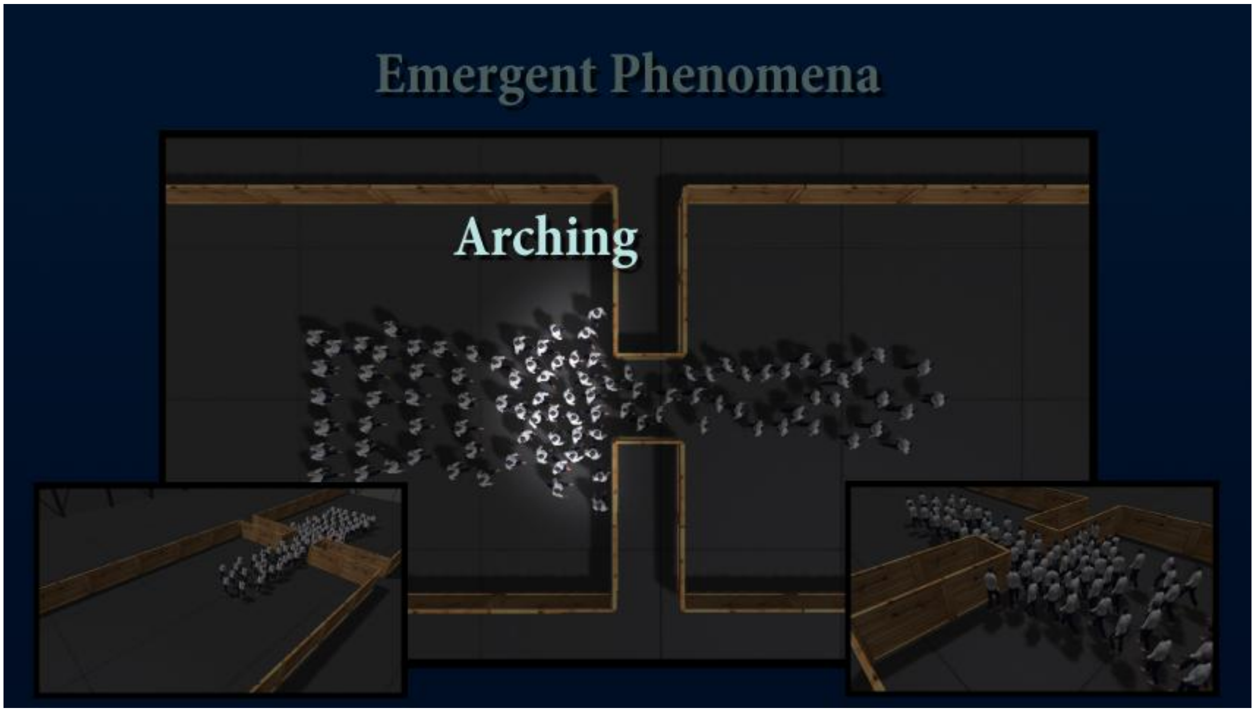
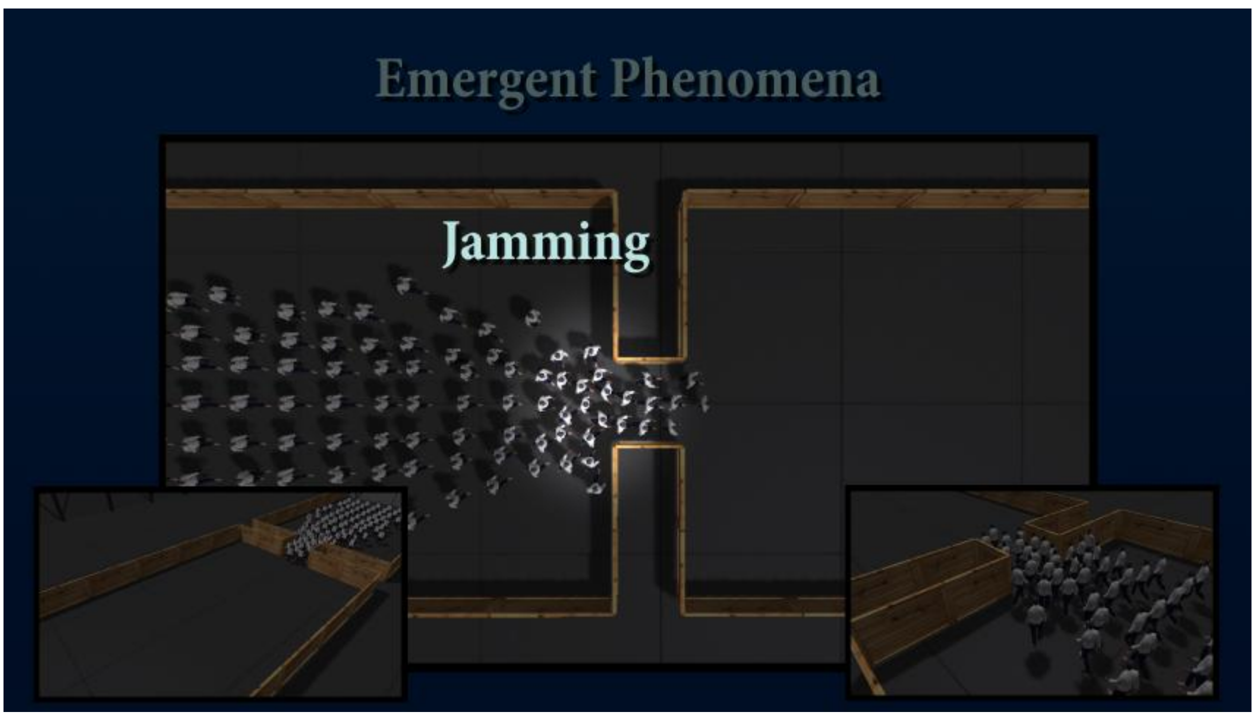


Figure 5 - Arching

As in real crowds, agent trajectories computed by PLEdestrian show arching (above) and jamming (below) at narrow bottlenecks.



II – Analysis

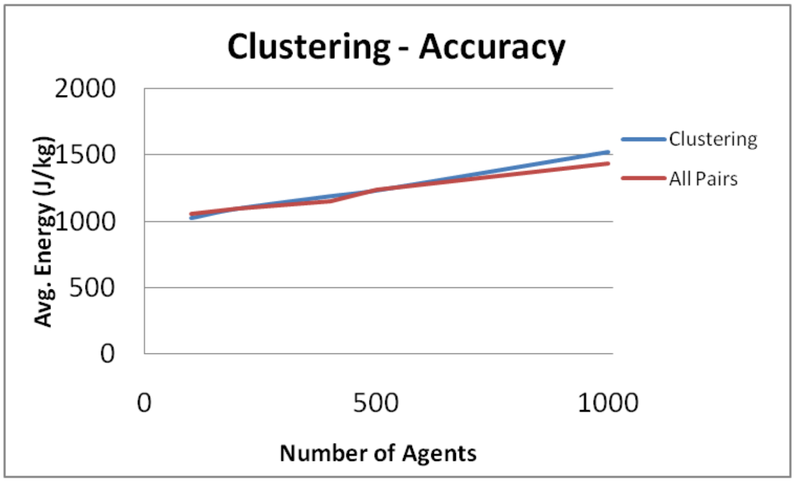
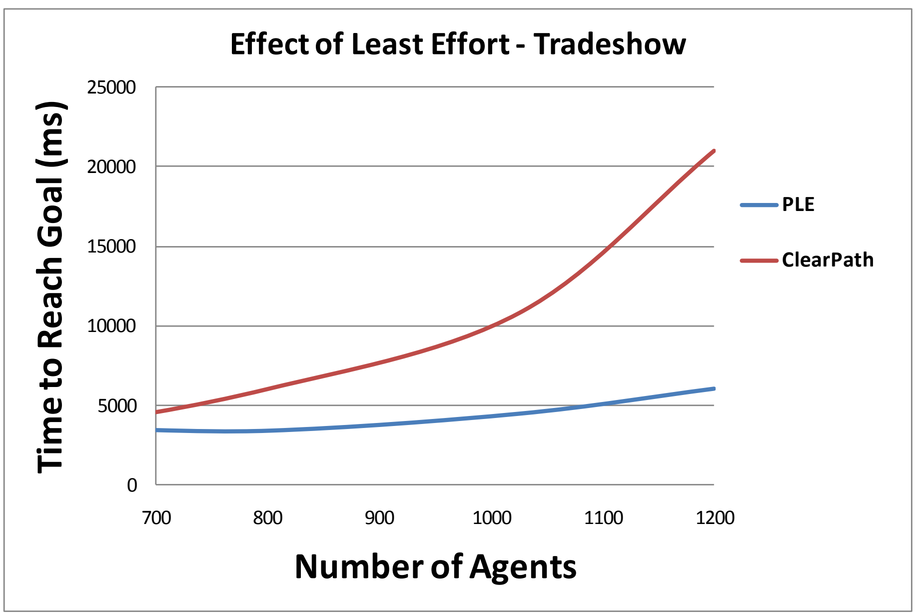
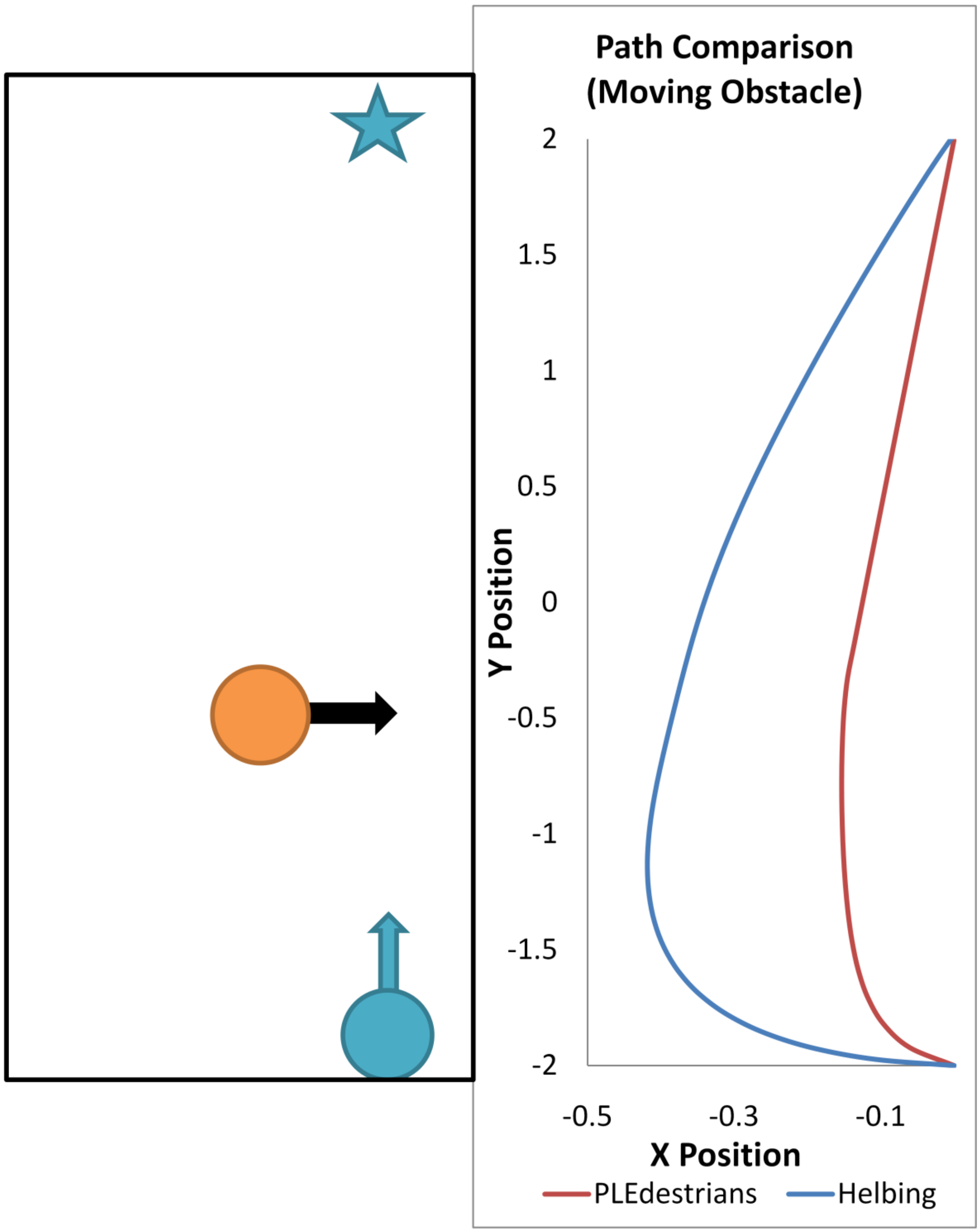


Figure 6 - Accuracy of Clustering Approximation

This graphs show that the total energy computed by the clustering—based algorithm is within 5% of that obtained by considering all pairs. As shown in Section 5.3, clustering can lead to 60X speedup (Figure 7) over the considering all the pairs.



This graph shows the time to exit in the trade-show model for PLEdestrian and the ClearPath algorithm [Guy et al. 2009]. Due to improved congestion avoidance, the agents in PLEdestrian algorithm reach their goals faster.



This graph shows the trajectories generated by PLEdestrian vs. Helbing's social force model [1995] in a simulation with a moving obstacle (shown on the left). The trajectory generated by PLEdestrian (in red) is more energy-efficient.