Supplemental Results: Images & Graphs

Paper ID – 0401

Appendix B – Supplemental Images & Results

I – Emergent Behaviors

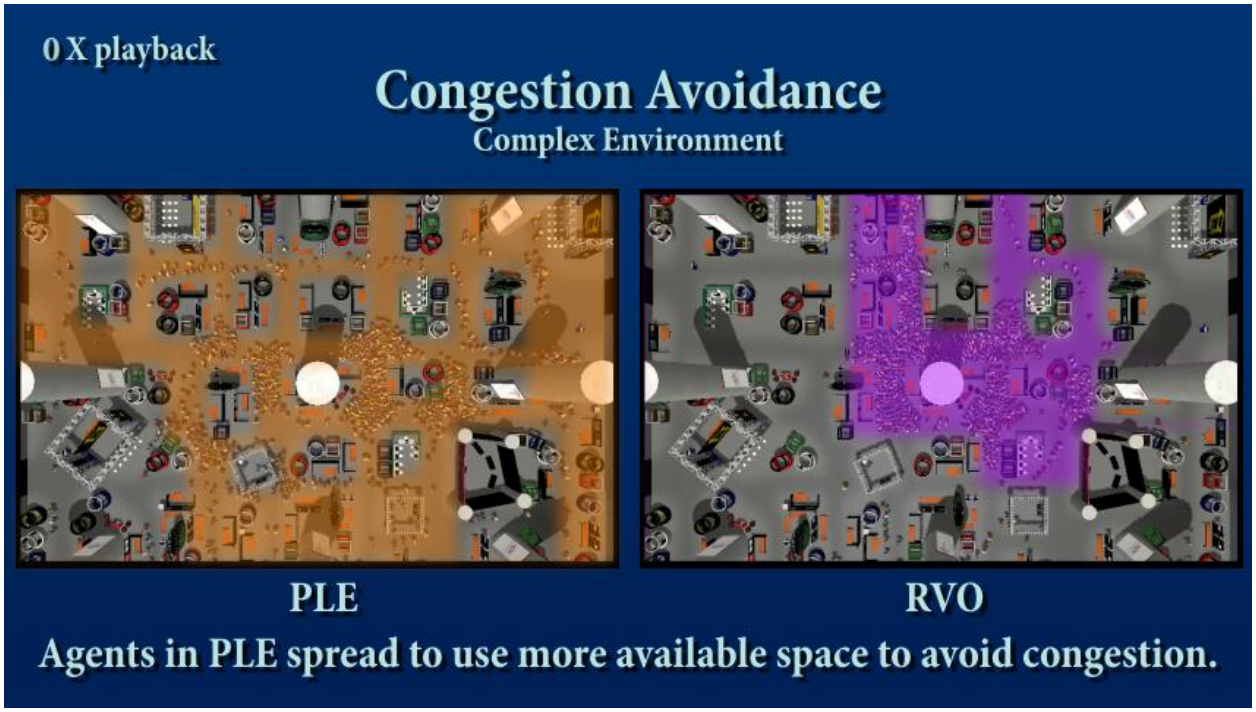
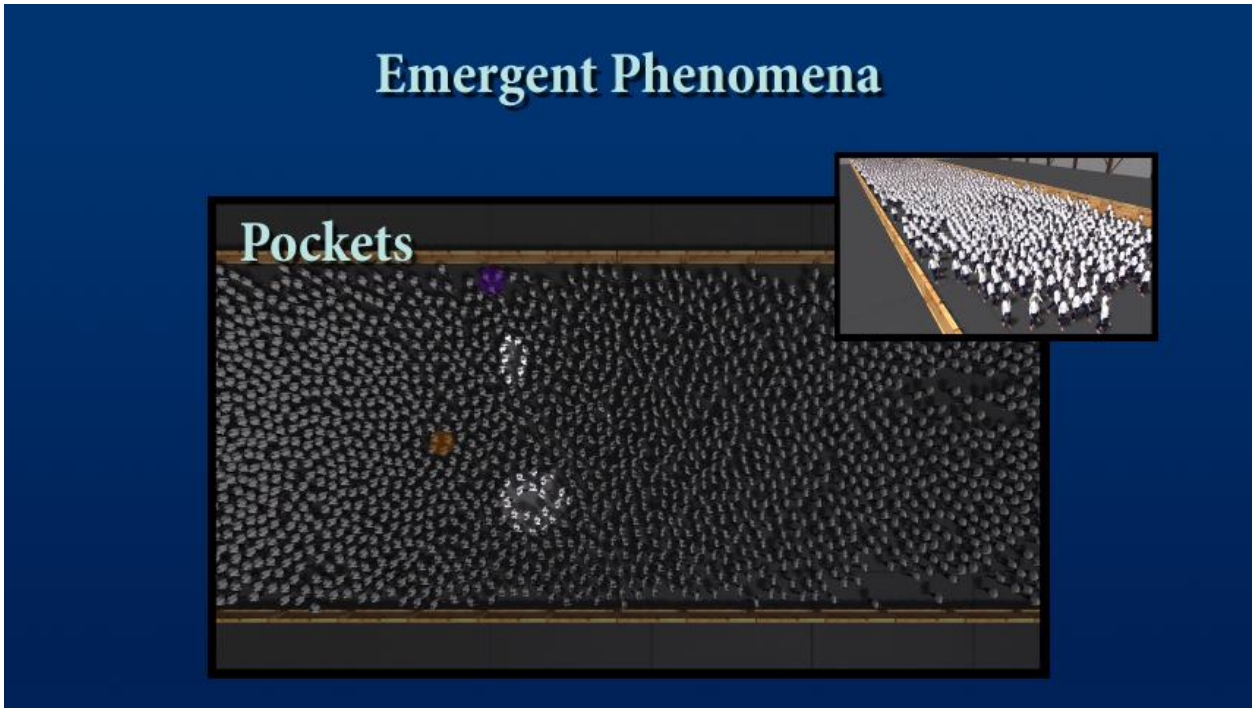


Figure 1 – Congestion Avoidance

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



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

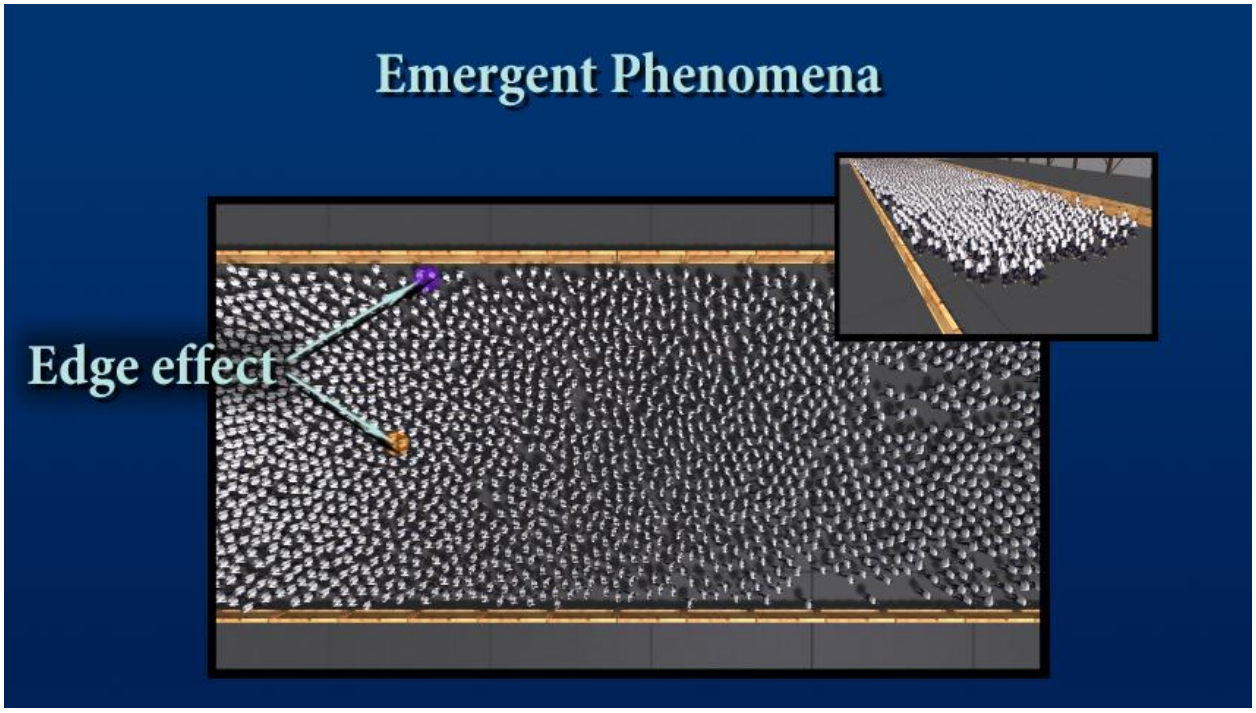


Figure 2 - Edge Effect

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

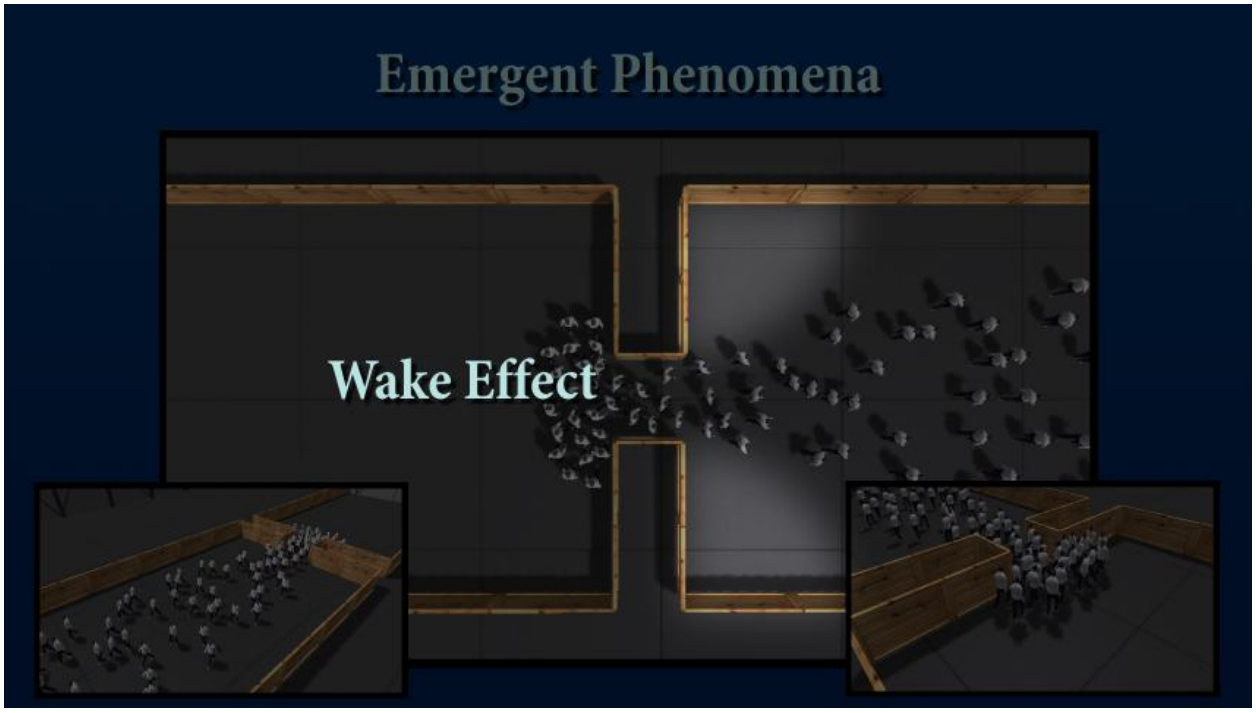
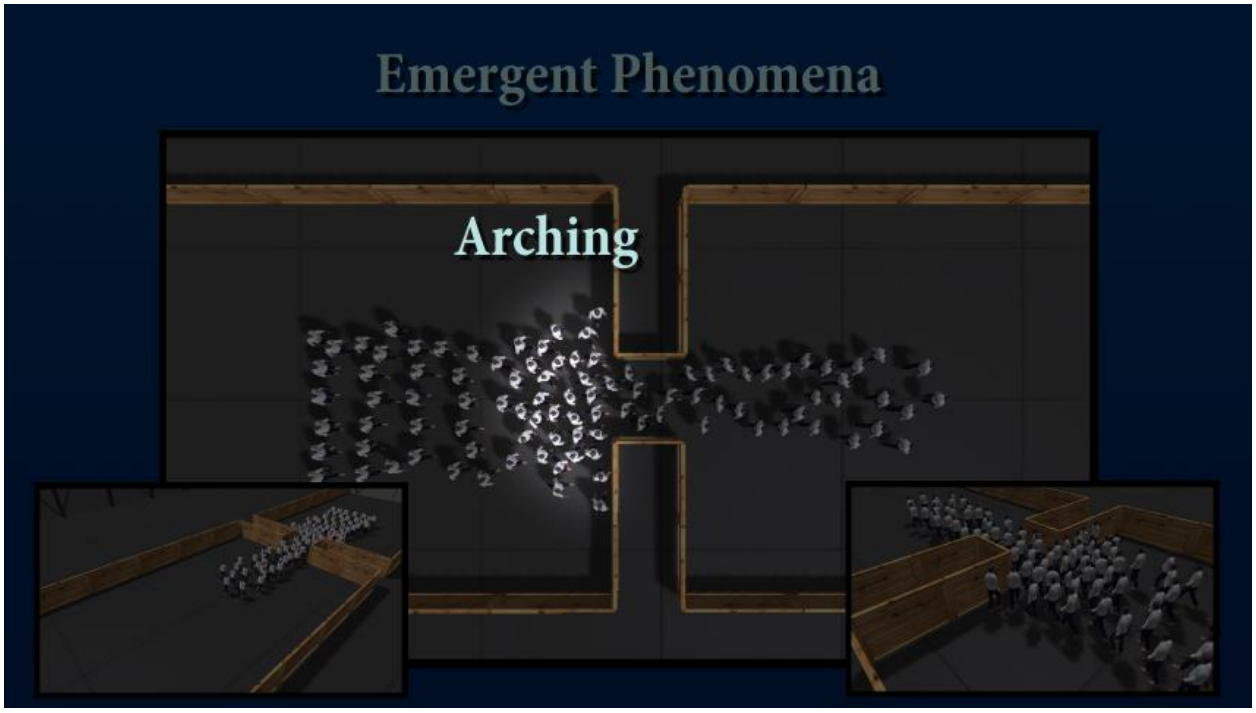
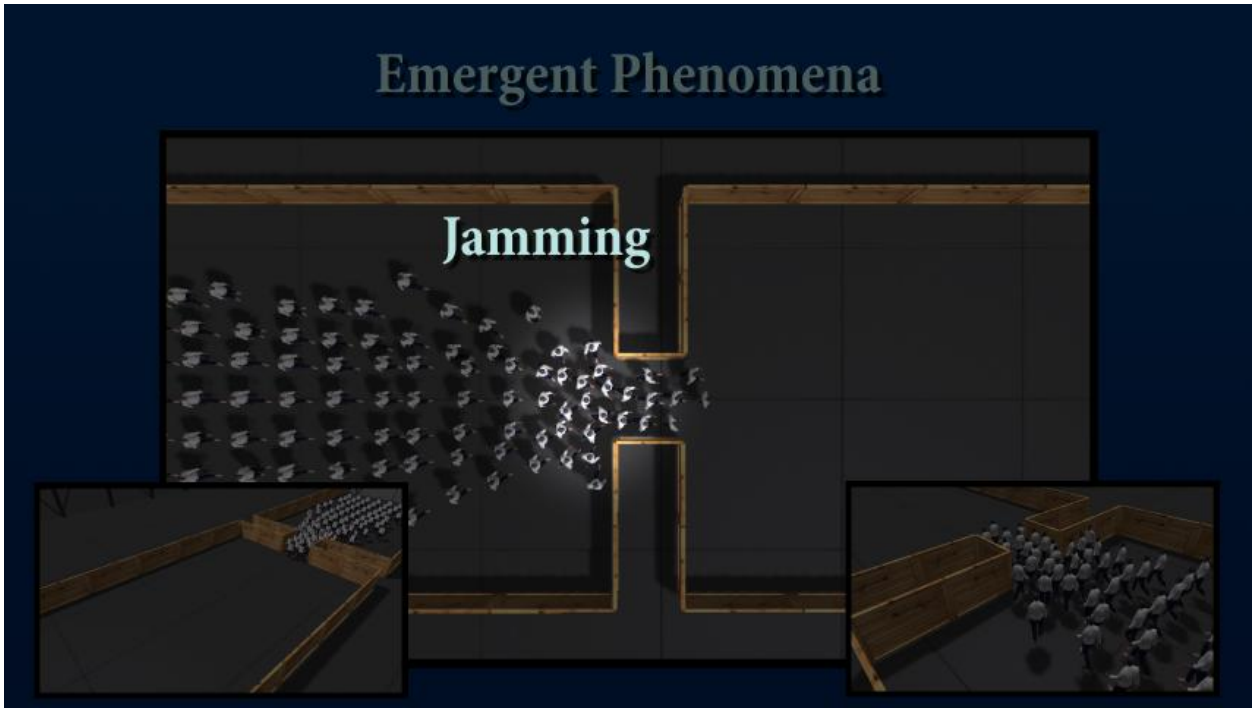


Figure 3 - Wake Effect

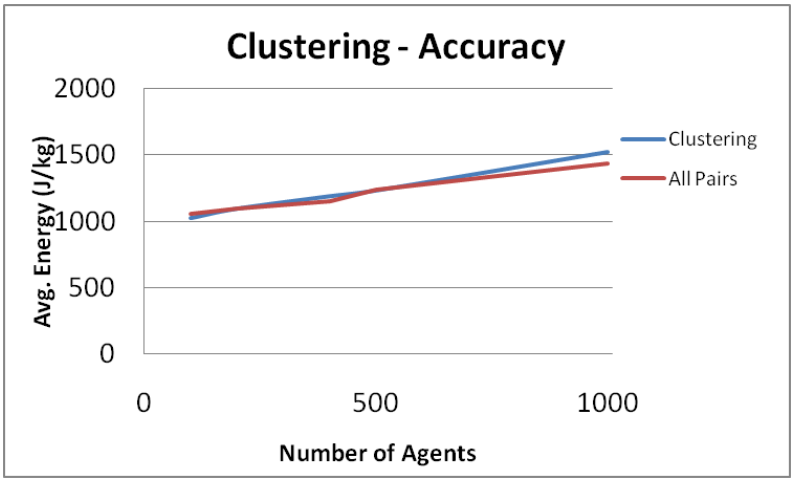
PLEdesterian algorithm can also generate wake effects, which arise when the agents don't fill up the space after narrow passages or other obstacles.



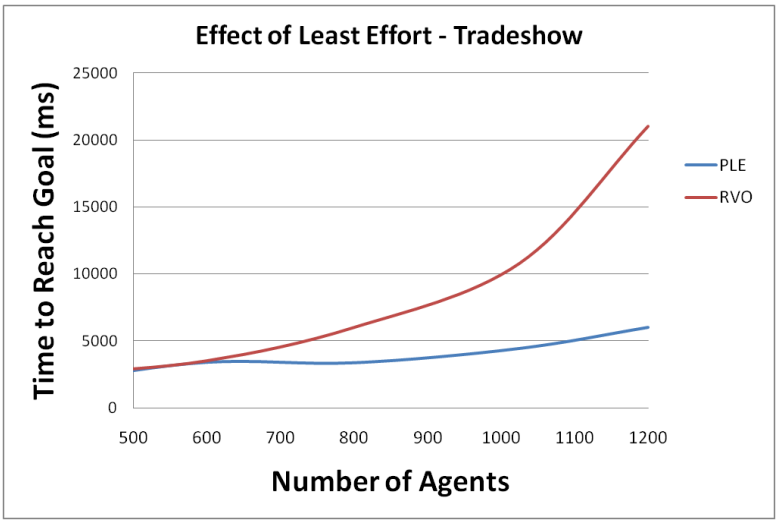
As in real crowds, agent trajectories computed by PLEdesterian show arching (above) and jamming (below) at narrow bottlenecks.



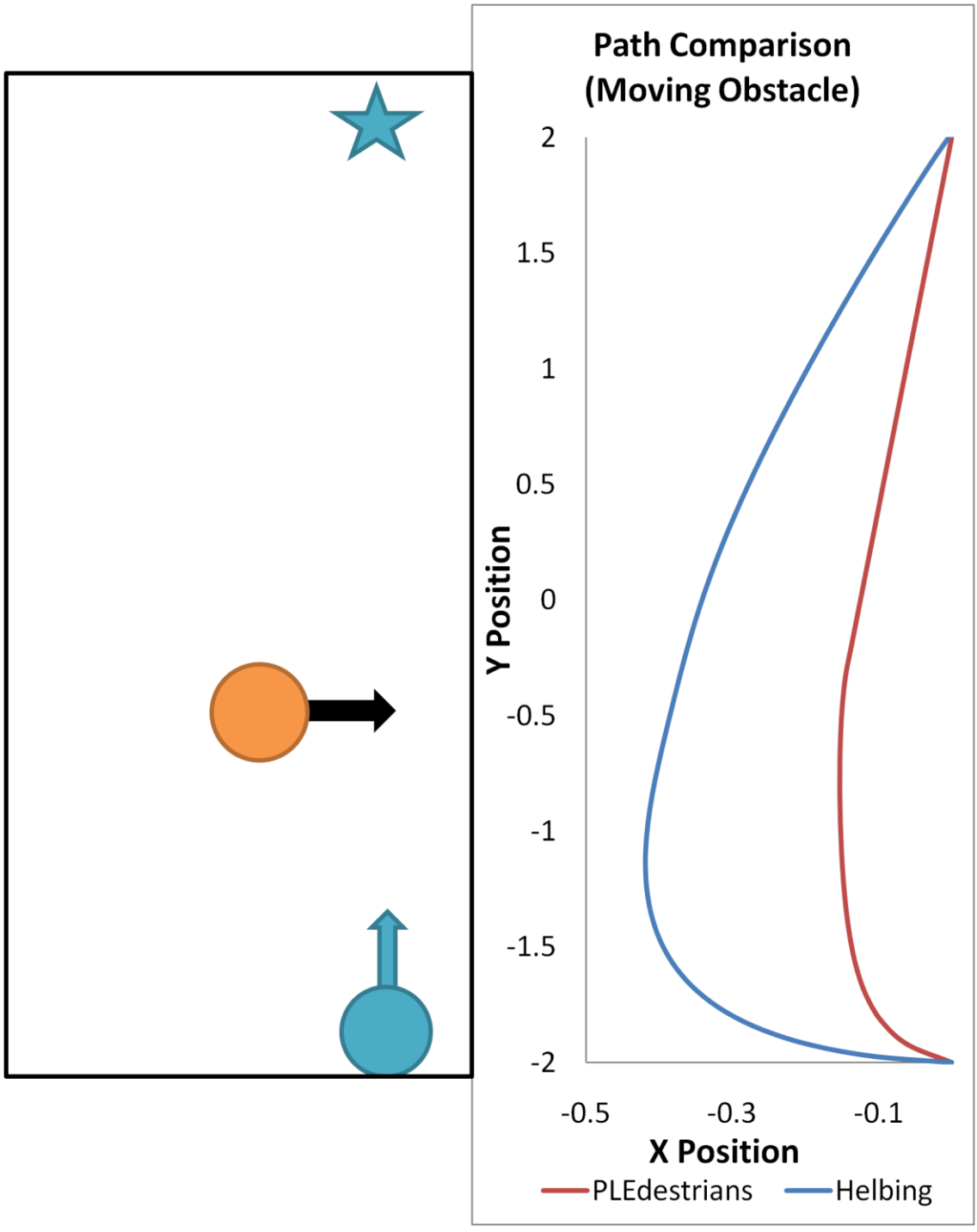
II – Performance & Accuracy



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 PLEdesterian and the RVO-based algorithm [van der Berg 2009]. Due to improved congestion avoidance, the agents in PLEdesterian algorithm reach their goals faster.



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