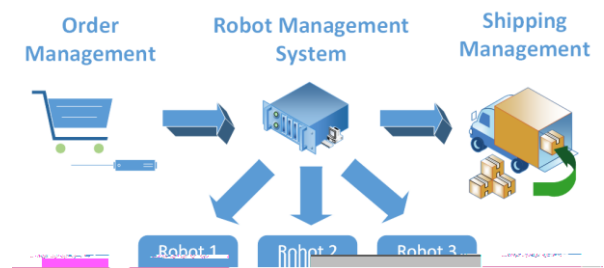
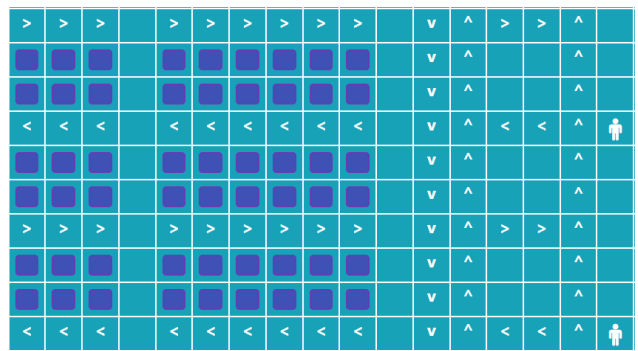
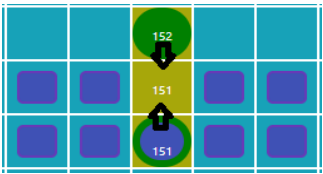


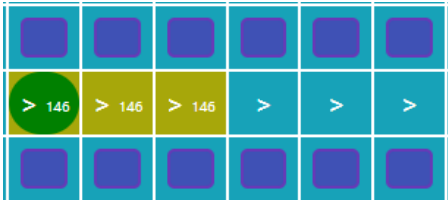
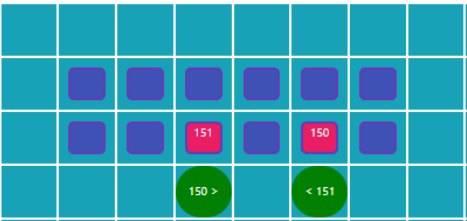
Path Planning for Multiple Mobile Robots in Smart Warehouse

Abstract—Warehouse operations need high labor force and physical space. Currently, companies with huge warehouses are investing on autonomous robots to save time and energy, and to prevent human-based errors. One of the most important challenges in a smart warehouse with multiple moving robots is path planning because of its dynamics. This paper provides a complete and error-free solution to the path-planning problem, and describes its performance in various warehouse scenarios with different number of robots and different design considerations.





(1)

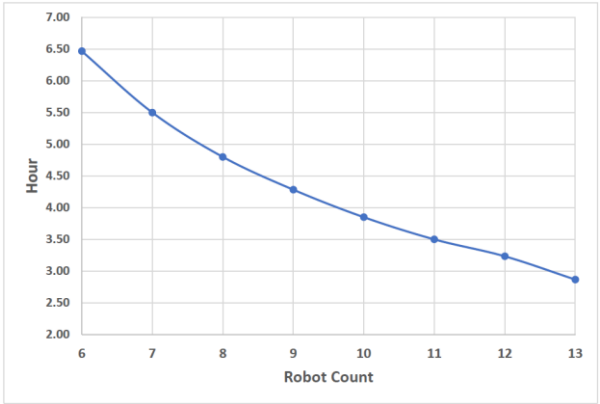
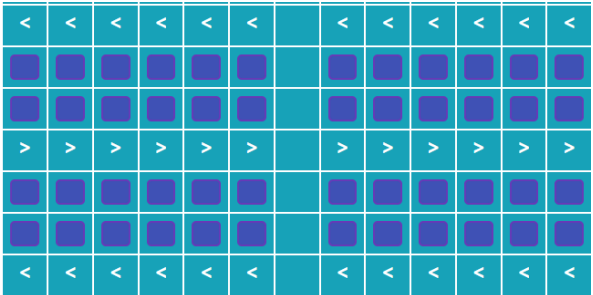


(2)

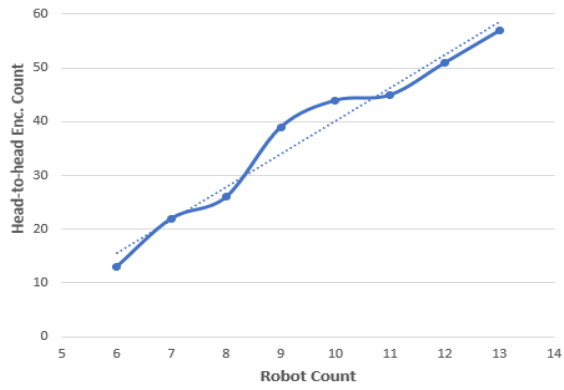
(3)

(4)

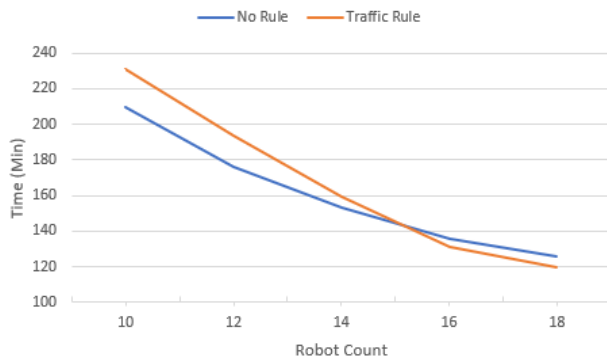
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Test Case	Pod Count	Task	Total Item	Time(min)	Total Km	HeadOn	Time(s)/Task	Time(s)/Item
V 4x2	361	772	1712	217	65	34	16.87	7.61
V 6x2	380	792	1715	229	69	54	17.35	8.01
V 8x2	401	783	1708	228	70	55	17.47	8.01
H 2x4	352	777	1681	218	66	28	16.83	7.78
H 2x6	384	782	1657	227	70	38	17.42	8.22
H 2x8	384	792	1696	234	73	33	17.73	8.28



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F. Duchoň, A. Babinec, M. Kajan, P. Beňo, M. Florek, T. Fico and L. Jurišica, “Path planning with modified a star algorithm for a mobile robot,”

			0.975			
	0.97					
			0.985			



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H. Roozbehani, R. D’Andrea, "Adaptive highways on a grid

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