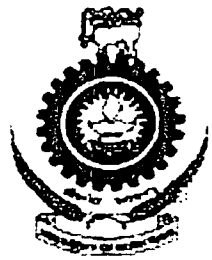


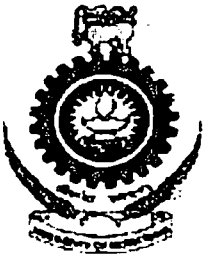
University of Moratuwa
Sri Lanka

SIMULATION SUPPORT TOOL FOR ROUTING OF AUTOMATED GUIDED VEHICLES

Master of Science in Operational Research
Department of Mathematics

T.S.S. JAYAWARDENE

November 2002



SIMULATION SUPPORT TOOL FOR ROUTING OF AUTOMATED GUIDED VEHICLES

T.S.S. JAYAWARDENE

This thesis was submitted to the department of mathematics of the university of Moratuwa is a partial fulfillment of the requirements for the degree of Master of Science

Department of Mathematics
University of Moratuwa
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November 2002

The work presented in the thesis in part or whole has not been submitted for the any other academic qualification at any institution.

UOM Verified Signature

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Abstract

Today's vast variety automated industries uses automatic guided vehicles (AGV) to material handling, transportation of work in progress (WIP) and many other purposes. Driverless operation and speed of handling together with the loading capacity make AGVs popularise among industries like newsprint, distribution, warehouse and manufacturing, food and pharmaceutical, apparel and clothing, household appliances, office and computer equipment.

In this report I try to address the automatic guided vehicle simulation in a given bilateral network avoiding conflicts between AGVs through the shortest distance path in shortest time with the constraints established by the AGV specifications and user defined dispatching policies. In previous studies emphasis is made only for one or few concerns and it could be collision free routing, shortest distance path, shortest time path, best dispatching policy or anything else. Matching of AGV capacities for demands, consideration of velocity profiles are rarely touched by researchers, because of the consequences in complexity arise with these considerations.

Dynamic approaches in holding data to smart handling of memory resource, extensive implementation of efficient algorithms with lesser time complexity to improve the speed of operation, appropriate scope selection for variables are few of key features used in coding. A complete coding is also provided as a supplementary booklet. In this report, a rational model building for simulation studies is also briefly discussed.

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