A ROUTE OPTIMIZATION PROBLEM IN ELECTRICAL PCB INSPECTIONS WITH ALIGNMENT OPERATIONS

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ABSTRACT. This paper considers a route optimization problem in advanced electrical PCB inspections. By considering the constraint that "camera-based alignment of position" needs to be conducted before electrical tests, the PCB inspection route optimization problem (PCBIRP) is modeled as a precedence-constrained traveling salesman problem (PCTSP), especially, as a pickup and delivery traveling salesman problem (PDTSP). Two of mixed 0-1 integer programming problem formulations are proposed. The computational times for the proposed formulations are compared by solving benchmark instances using some of well-known mathematical programming solvers.

Key words and phrases. Printed circuit board (PCB), inspection route optimization, pickup and delivery traveling salesman problems, mixed 0-1 integer programming problem, exact solutions.