

## **Enhancing efficiency of automobile assembly line using the Fuzzy logical and Multi-objective Genetic Algorithm**

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### **ABSTRACT**

Automobile manufacturing is one of the most important industries in the world. Assembly line is one of the main supply chain of the industry. It contains several workshops and stations where each station consists of many different tasks. These tasks are processed by workers using tools and machines. The unbalancing time is the main problem of the assembly line. This issue presented by the Cycle Time station (CTs) which is unequal among stations that resulted in queuing and idle time which inhabit the productivity of the assembly line . In this study, Multi-Objectives Model (MOM) and Genetic Algorithm System (GAs) are combined to form (MOGA) in order to solve the assembly line issues. The Fuzzy Logical Control (FLC) organizes an application of the MOGA to solve the Assembly Line Unbalancing (ALB). The new technique in this study is use to develop the efficiency of the assembly line and to solve the unbalancing problem among stations. The developed MOGA will increase the volume of the production and reduce the queuing and the idle time and maximizing the productions by increase the efficiency of working time. In addition, the models will be redistributed the responsibilities to the workers to minimize the queuing and idle time among the stations and append new workers to obtain the optimum balance. The modern approach will obtain an optimum balance and enhances the efficiency of the assembly line.

### **KEYWORDS:**

Assembly line balancing (ALB); multi-objective genetic algorithm (MOGA); fuzzy logic controller (FLC); worker allocation; hybrid assembly line; process management.

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