



# **Selection and optimization of working groups Machines on Earthworks projects by Using Genetic Algorithm and Comparison of the results of a project carried out**

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## **Abstract**

One of the most important factors in successful projects and large construction projects, as well as how to choose the machines and their management is. In addition, projects that are large soil operations, Machinery is the most important part of the project. In this paper we use a mathematical model to examine the question of machinery Earthworks. Due to the high volume parameters and calculations, the program was written using genetic algorithms, which have the ability to resolve the above issue. Then with The comparison of a construction project that has already been implemented and all the data that was available, with the results of this study, the results of the project was to optimize the cost and time.

**Keywords: Machines, Earthworks, Optimization, Genetic Algorithm.**

## **1. INTRODUCTION**

In a soil operation, the main goal of the project, the project with the least overall cost of operations. It includes operational data volumes and data, during the time period during which the project must be completed and the number and characteristics of all machinery that could be used for this project, are. Against, Unknown parameters, including production and the corresponding cost for each machine Allocation of suitable machinery for each project activity and the detailed planning of operations. Indeed determine the volume of soil, where it ought to be moved by what machinery.

In recent years considerable progress has been made in this regard However, all these methods have limitations in terms of volume of work or machinery under cover, respectively.

In this study, we tried to make use of a mathematical model is comprehensive selection of machinery Earthworks examined. To solve the problem, a model to optimize fleet of machines for the production of certain proposed that it can be used without any limitation on the number, type and model of machine select the best car. The mathematical model also accounted for optimal fleet of amphibious operations, provided that the appropriate allocation of fleet operations to optimize the unit cost of production. By combining these two mathematical models and solve them in a row, it selects the best machinery in order to optimize the overall cost of dirt as matter can be resolved. Due to the high volume parameters and the model calculations in a project Earthworks individually and manually is very time consuming and difficult calculations. Therefore, the computation is inevitable. That's why the program was written using genetic algorithms, which have the ability to resolve the above issue is. In this program after importing a project (such as the time and the total volume of operations, the amount of excavation and embankment, soil type, location and loan deposits depot, the transportation routes, number, type and specifications of machines available for use in projects and cases other) The system calculates the rate of production machinery and machine costs and Fleet optimization based on the production rate set by the user And at the end The fleet will be assigned to the project, the project during his time with the least possible cost to the finish.