A comprehensive study: Ant Colony Optimization (ACO) for Facility Layout Problem

Raed Abdulkareem Hasan
Ph.D. candidate of the Department of computer system and software engineering,
University Malaysia Pahang (UMP), Malaysia
raed.isc.sa@gmail.com

Mostafa Abdulgafoor Mohammed
Ph.D. candidate of the Faculty of Automatic Control and Computers,
University Polytechnic of Bucharest, Romania
alqaisy86@gmail.com

Nicolae Țăpuș
Professor, Faculty of Automatic Control and Computers,
University Polytechnic of Bucharest, Romania
ntapus@cs.pub.ro

Omar Abdulmaged Hammood
Ph.D. candidate of the Department of computer system and software engineering,
University Malaysia Pahang (UMP), Malaysia
Omer_almageed@yahoo.com

Abstract- **In context of manufacturing, numerous models are designed to appropriately represent the facility layout problem (FLP) and a variety of optimization methods have been applied to solve these models. The ultimate goal of these methods is to find optimal solutions, In regard to Swarm Intelligence (SI), Ant Colony Optimization (ACO) and Particle Swarm Optimization (PSO) are regarded as the most important SI techniques of our time. In this paper, a brief introduction for the so far most promising approaches to facility layout related topics, are provided. The succeeding paper will then illustrate some of those, in more detail. Moreover, we examine ACO modifications and extensions that could contribute to optimization methods in FLP; mostly conform to NP-hard combinatorial problems. future research areas are identified in Construction Site Facility Layout Problems, Multi-Criteria Facility Layout Problems and Dynamic Facility Layout Problems.**

Keywords - facility layout problem (FLP), Ant Colony Optimization (ACO), Computational Intelligence.