## Path-planning for an autonomous robot using a simulating annealing

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## Abstract

The main purpose of this paper is to solve the problem of robotic path-planning utilizing a simulating annealing (SA) algorithm, a robust scheme used in searching for the global optimum by imitating the softening process of metal. In this paper, a two dimensional mobile robot used in two barrier systems has been introduced. The simulating annealing algorithm provides a solid alternative to conventional methods of path-planning. Moreover, the optimization parameters for the desired path can easily be changed without a total overhaul of the overall algorithm. Consequently, an efficient path that avoids obstacles within a working area can be easily found using the SA algorithm.

Keywords: path-planning, simulated annealing, robot

## 1. Nomenclature

This paper is constructed on the basis of the following notations:

C: Boltzmann's factor *iter*<sub>max</sub>: Maximum iteration *kk*: Cooling rate in *SA*   $L_1, L_2$ : Lengths of inlet/outlet straight ducts (*m*) *OBJ<sub>i</sub>*: Objective function *pb*(*T*): Transition probability *P*(*k*): Penalty function of the objective function

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