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Tabu Random Algorithm for Guiding Mobile Robots

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Abstract : The use of optimization algorithms is common across a large number of diverse fields. This work presents the use of a hybrid optimization algorithm applied to a mobile robot tasked with carrying out a search of an unknown environment. The algorithm is then applied to the multiple robots case, which results in a reduction in the time taken to carry out the search. The hybrid algorithm is a Random Search Algorithm fused with a Tabu mechanism. The work shows that the algorithm locates the desired points in a quicker time than a brute force search. The Tabu Random algorithm is shown to work within a simulated environment using a validated mathematical model. The simulation was run using three different environments with varying numbers of targets. As an algorithm, the Tabu Random is small, clear and can be implemented with minimal resources. The power of the algorithm is the speed at which it locates points of interest and the robustness to the number of robots involved. The number of robots can vary with no changes to the algorithm resulting in a flexible algorithm.

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