



MOBILE ROBOT PATH PLANNING USING HYBRID GENETIC ALGORITHM AND TRAVERSABILITY VECTORS METHOD

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ABSTRACT—The shortest/optimal path generation is essential for the efficient operation of a mobile robot. Recent advances in robotics and machine intelligence have led to the application of modern optimization method such as the genetic algorithm (GA), to solve the path-planning problem. However, the genetic algorithm path planning approach in the previous works requires a preprocessing step that captures the connectivity of the free-space in a concise representation. In this paper, GA path-planning approach is enhanced with feasible path detection mechanism based on traversability vectors method. This novel idea eliminates the need of free-space connectivity representation. The feasible path detection is performed concurrently while the GA performs the search for the shortest path. The performance of the proposed GA approach is tested on three different environments consisting of polygonal obstacles with increasing complexity. In all experiments, the GA has successfully detected the near-optimal feasible traveling path for mobile.

Key Words: Path Planning; Mobile robot; Genetic Algorithm; Traversability Vectors