



AN EVOLUTIONARY NAVIGATOR FOR AUTONOMOUS AGENTS ON UNKNOWN LARGE-SCALE ENVIRONMENTS¹

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ABSTRACT—Computation of a collision-free path for a movable object among obstacles is an important problem in the fields of robotics. In previous research we have introduced an evolutionary algorithm for a robot moving on a known map considering a 4-connected grid model, and we have obtained encouraging results. In this paper, we focus our attention on a more complex motion planning problem: An autonomous agent with a limited sensor capability which is moving in a completely unknown large-scale environment. We introduce an evolutionary approach that has shown some adaptation abilities due to its constant update of its environment knowledge, and re-planning only when it is strictly required. We compare our approach for various map sizes to a very well-known evolutionary algorithm and to the complete approach D* Lite. Our algorithm outperforms them in both CPU time and in the number of re-plannings.

Key Words: Evolutionary Robotics, Large-Scale Maps