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MINIATURE AUTONOMOUS MOBILE ROBOTS (MAMRS) FOR SPACE EXPLORATION USING
SWARM INTELLIGENCE (SI) ALGORITHM.

Abstract

Despite the long history of robots serving a variety of purposes, including space exploration, there is a need for developing increasingly intelligent robots that can take better decisions without human involvement and can take more sophisticated paths. From previous research, simulation and experimental results showed that algorithms play a key role in determining an optimal path (short, smooth, and robust) for autonomous robot navigation, and simultaneously, it proved that appropriate algorithms can run fast enough to be used practically without incurring time-consuming complications. Miniature Autonomous Mobile Robots (MAMRs) can be used for space exploration using Swarm Intelligence (SI) algorithm, a form of Artificial Intelligence (AI) that relies on the collective behavior of elements in decentralized and self-organizing systems. Miniature size would allow for more MAMRs to be sent out for better exploration and results. Miniature size would allow for more MAMRs to be sent out for better exploration and results. The purpose of this paper is to present the deployment of multiple miniature autonomous mobile robots (MAMRs) using the Swarm Intelligence (SI) algorithm to move in an obstruction-free path, and to develop and simulate a mathematical model and control system of MAMRs using MATLAB which can be applied for planetary exploration, asteroids analysis and other space exploration programs.