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AUTONOMOUS NAVIGATION OF A LUNAR EXCAVATION ROBOT USING ARTIFICIAL POTENTIAL FIELD METHOD

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ABSTRACT

NASA Lunabotics Mining Competition is an annual robotics competition organized by NASA Kennedy Space Center at their Visitors Complex in Florida every year. In May 2013, a team from Manipal University participated in the 4th Annual Lunabotics Mining Competition. The participating teams need to develop a tele-operated or automatic lunar excavation robot to mine lunar soil (regolith) on a simulated lunar surface. This article presents the methods used by the team in order to achieve full autonomy of the robot for the traversal of the pre-described arena. This paper describes the project from the formulation of the navigation algorithm to the simulation in detail keeping focus on the basic and specific functionality of the robot.

KEYWORDS: Mobile Robot, Autonomous Navigation, NASA Lunabotics Mining Competition, Artificial Potential Field Method, Encoder Based Tracking