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DE - CENTRALIZED NETWORK FOR CO-ORDINATED LUNAR ROBOTIC ACTIVITY

Abstract

After a decade mankind is again going back to the moon; this time to stay and develop sustainable infrastructure by exploiting resources available on the Moon. While Developing Lunar Base astronauts have to deal with lots of hurdles due to lack of infrastructure. The Moon is only 5% explored. We want to explore all the areas of the moon where we can potentially set up a lunar base and find resources to mine. In this quest, robotics will play a significant role to guide and be a companion for Astronauts to explore critical lunar sites. This paper highlights development of Lunar Robotic Network Architecture to perform coordinated and efficient lunar activities such as Mining, Exploration, or companion for astronauts to carry equipment for EVA (Extra-Vehicular Activity). This Robotic Network will utilize a de-centralized command station that will rely on commands to different robots according to the need; all the bots will be able to communicate with each other using a secured lunar network that will be specifically deployed for Lunar Settlement. The Bots will have separate enclosures according to their operation. The De-Centralized system will run on AI (Artificial Intelligence) enabled Supercomputer that will keep track of the bots using a dedicated Lunar Sat constellation and GPS positioning for Lunar activity. The data generated by these bots will be transferred to the Lunar Data Center which will be developed as part of Lunar Infrastructure to store Lunar-based Scientific Experimental data; it can be accessed using cloud architecture on earth via Deep Space Network (DSN). This Method will ensure continuous and sustainable activity on lunar grounds even without human interference.

Keywords: Lunar Infrastructure, Lunar Network, Robotics, AI, Lunar Supercomputer, Data Center.