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LUNAROO, JUMPING TO NEW HEIGHTS

Abstract

LunaRoo is a small hopping robot concept for future lunar usage which uses jumping as a mechanism by which to overcome obstacles and gain height for imaging the local area. It is compact enough to fit in a 100 mm cube and weighing less than 1.3 kg and can jump to heights of 20 m on the moon. At 20 metres, it can then acquire images from a unique perspective for traversability analysis, obstacle detection, and beyond-the-horizon planning in order to act as a scout for rovers or humans. It can also use this height to briefly bridge line-of-sight communication gaps or to roam further afield as a rover itself.

It was originally developed as a proposal for the PTScientists' Lunar Rover but has then been developed further with a broad range of technologies under investigation for feasibility and effectiveness. LunaRoo's primary strengths are its simplicity, small size and weight for a rover, and its great terrain traversal properties. It's a very flexible unit and has been designed with payload space to allow it to carry out a broad range of scientific missions. It is to be solar powered in order to keep mass down and to allow for long distance activities. Interaction with the regolith is also an important aspect for any jumping robot and this is taken into account with the design of the mechanism and foot options. LunaRoo is an innovative robot solution for future Lunar missions as an assistant to other activities or as a rover itself jumping onwards as a long-range explorer.