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TRAJECTORY-SPACE GENERATION SCHEME FOR FUTURE PLANETARY LANDING

Abstract

Efficiently investigation of scientifically important terrain is a crucial issue for modern space exploration unmanned missions. While the terrain contains lots of craters, full of rocks, less plane surfaces etc. then the single lander mission is quite inefficient to explore large area. Again multi-lander with multi launch missions is quite expensive. In this cost cutting era, now it becomes vital issue to think again how the single launch mission will be able to explore a large area of a scientifically important destination in space. Among multiple solutions, authors are planning to investigate a single launch mission carrying multiple landers. Landers are being descended from its orbital condition towards the pre-defined landmarks on the planets following an auto generated landing trajectory. Research work will be conducted to generate a landing trajectory-space instead of generating a single trajectory from which landers will be initiated for powered descent phases choosing its particular trajectory from the generated trajectory-space automatically fulfilling some predefined mission objectives. To analyze the performance of this new idea, authors are considering the Moon as primary destination.

The objectives of the research are (1) to develop an algorithm for trajectory-space generation of multi-explorer planetary landing and (2) to analyze the performance of precise landing mission.