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INTRODUCING A NOVEL FAST TERMINAL SLIDING MODE CONTROL WITH THE APPLICATION OF SPACE ROBOTICS

Abstract

This paper introduces a Novel Fast Terminal Sliding Mode Control (NFTSMC) and applies it on a space robot that needs trajectory tracking with the purpose of landing softly on an asteroid. The study employs the suggested NFTSMC to both manage the landing trajectory and to enhance the dynamic tracking performance. The Novel controller successfully puts the modes of the system on the sliding surface in a limited time, and presents many advantages over both the Proportional Derivative Sliding Mode Controller (PDSMC) and the Fast Terminal Sliding Mode Controller (FTSMC). The results show that employing NFTSMC raised the speed and improved the tracking accuracy.