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HUMAN ASSISTED RELATIVE NAVIGATION FOR EXPLORATION

Abstract

NASA exploration missions with the Orion spacecraft will carry astronauts further from earth than ever before. Missions are being envisioned that will perform rendezvous and capture of sample containers, and docking with habitats and robotic vehicles for lunar vicinity missions and ultimately for human missions to Mars. Crews will perform critical functions during these missions, but will increasingly rely on automated and autonomous assistance to complete high risk and complex operations at distant in-space locations. Lockheed Martin is developing and testing capabilities for proximity operations, approach and docking/capture with other in-space elements. This paper presents a description of and rationale for capability that integrates human assistance with software performing feature detection, tracking and pose estimation for relative navigation.