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SPACE SYSTEMS SYMPOSIUM (D1)
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DESIGN OF A MULTI-AGENT SYSTEM FOR COST REDUCTION IN MULTI-CRAFT SPACE MISSIONS

Abstract

An approach for reducing the costs of multi-craft space missions using multiple autonomous agents is presented in this paper. The approach hinges on replacing the ground and space based control systems with an integrated multi-agent system (MAS) comprised of specialised autonomous agents. We describe in particular how this design is applied to ESA's DARWIN exo-planet telescope mission and define the structure of the MAS. The design shows improvements over a traditional control system design in a number of areas, most notably in the reliability of the spacecraft in unexpected scenarios, significantly lowered ground control requirements and much easier re-use of individual agents in other missions, all leading to reduced operational costs for the mission.