

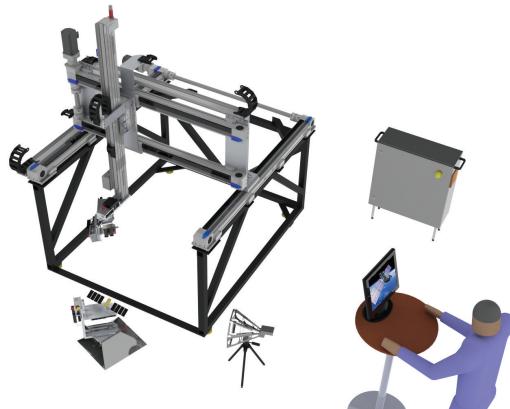


Commissioning, calibration and measurement of the accuracy of a simulator for rendezvous maneuver of spacecrafts

For the navigation of spacecrafts in coupling maneuvers detailed information on location, geometry and surface of the target are necessary. Complex image processing algorithms generate these data from images recorded by cameras.

A special demand on the algorithms is the use in space. Typically changing light conditions, different backgrounds and reflections on surfaces are occurring. To meet these challenging environmental conditions, it is essential that robust algorithms and procedures are developed and tested. The demonstrator MiPOS is an environment for preflight simulation of spacecraft on a smaller scale under realistic conditions. MiPOS controls a camera module in six degrees of freedom and a target object in three degrees of freedom. It is necessary to know the accuracy in positioning of the camera and the target to evaluate the quality of the algorithms.

In this diploma thesis the demonstrator was assembled and put into operation. Furthermore deviations in positioning have been described mathematically and strategies to improve accuracy have been suggested.



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