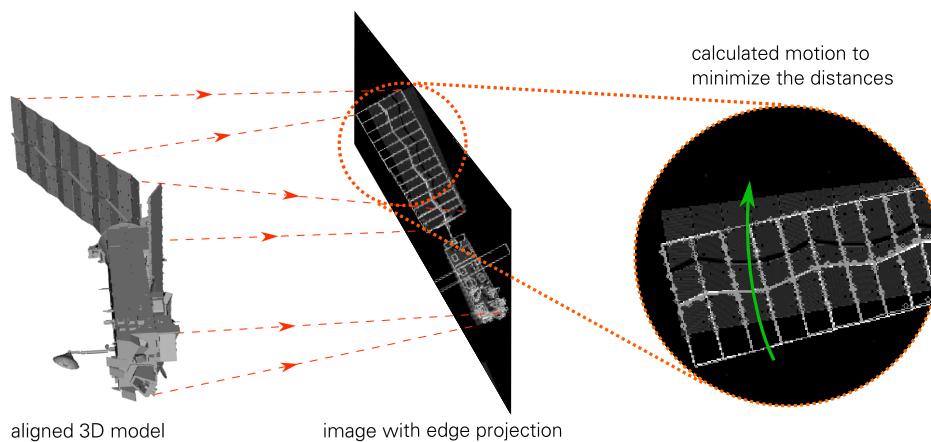




## **Model based pose determination and tracking of known objects for spacecraft rendezvous maneuvers**

Autonomous navigation of spacecrafts may reduce errors in steering and highly relieve the control center. This work will develop a method to calculate and track the relative pose (position and orientation) of an approaching spacecraft with respect to a known target only with images of a camera system. The capability for real time calculations is a main requirement to the system and affects the choice of algorithms. With a rough estimation of the pose and a 3D model of the target, the main edges of the target are projected in the current image. Perpendicular to these edges, strong changes in pixel intensity indicate the corresponding edges of the target in the image. The optimal pose can be calculated with an iterative minimisation of the distances between these edges over the whole target. With the information about the success of the tracking, an external modul can decide if the pose was calculated correctly and if the current course of the approach should be alternated.



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Day of Submission: 27.10.2015

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MASTER THESIS

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