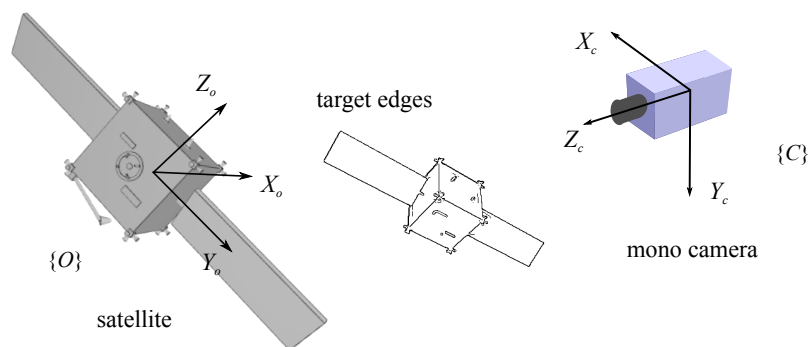




## **Model-based pose estimation of known objects from image data based on the object edges**

In the scope of this diploma thesis, a localization system based on computer vision is presented, with a particular focus on space autonomous rendezvous applications. This localization system is able to estimate the full six degrees of freedom localization parameters of the considered target object relative to the camera coordinates. It is assumed that a fixed 3D CAD model is available for pre-generating synthetic templates.



The target is extracted by means of background subtraction technique. Its edges are extracted with Canny detector and then used for matching a set of previously stored templates to retrieve the pose parameters with use of a monocular camera system. Chamfer Matching and Affinity propagation are modified and applied for this purpose.

The localization system can probabilistically estimate the full pose based on the result of matching and alignment. The concept presented in this thesis can serve as initialization of a frame-by-frame pose tracking. With the help of them, the Rendezvous maneuver between autonomous approaching Chaser and an uncooperative target comes to be possible.

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Day of Submission: 26.05.2015

DIPLOMA THESIS

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