

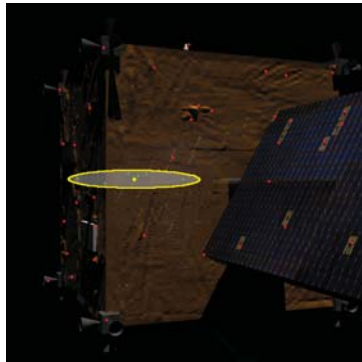


Research on an Information Feedback of a State Estimation System

When proceeding a rendezvous manoeuvre with two space crafts, the relative pose and the relative velocity between the chaser and target have to be determined. They can be estimated using a camera system and a state estimation algorithm, i.e. visual navigation.

Image features are extracted from the image data and a filter estimates the three dimensional positions of the associated landmarks (points at the target, that can be characterised by a feature) and their uncertainties. In order to improve the correspondence search process, the results of the filter are used to create a search area for possible feature matches. This paper describes how this is done by projecting the landmarks' covariance ellipsoids into the camera frame. Only those of the extracted features, which are inside the projected ellipse are possible candidates to be matched with landmarks. If they are chosen to be the best match, they can be excluded from further costly operations.

Research has been done to evaluate whether this way of feedback is generating the desired improvement or if the increased computing time for projecting the ellipsoids turns out this approach to be unfavourable.



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STUDENT RESEARCH THESIS

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