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A passive camera based determination of a
non-cooperative and unknown satellite's pose and
shape

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Abstract

The relevance of autonomy in space systems during rendezvous and docking operations has been lately increasing. At the scope, a robust GNC architecture is required, which strictly relies on the navigation system's performance and must assure both high efficiency and safety, i.e. low errors and no collisions with the target satellite. One of the most explored fields is the optical navigation one. Using passive optical sensors such as cameras can give high benefit in terms of characterization of the observed scene, thus enlarging the consciousness of what is going on in the mission scenario. The present research investigates the development of a filter which can estimate the shape and relative attitude, position and velocity of a non-cooperative, possibly unknown satellite orbiting around Earth, observed by a camera and a distance sensor mounted on a chaser satellite,

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