Image processing chip for planetary landing applications (University of Dundee)

Optical imagery provides a powerful means of autonomous navigation for spacecraft in the vicinity of Solar system bodies, where the communication delay may be much larger than the dynamical timescales. For these purposes, we have developed an image processing chip designed to handle the high frame rate required for descent and landing onto large planetary bodies. We describe the algorithm that extracts and tracks surface features through the sequence of images, and investigate several extensions designed to improve the robustness of feature tracks used to support navigation.
We outline a scheme that enables absolute navigation through the automated identification of known surface features, and discuss the possibility of obtaining a rudimentary shape model for small bodies (asteroids) using only optical imagery."