

Neptec UK Ltd; Unified 3D Perception Unit

Executive Summary

Project Introduction:

Visual navigation systems for space (both orbit and exploration) are developed with processing units almost entirely tailored for each particular sensor and for each particular mission which is both expensive and time consuming. This has a second detrimental effect of obstructing the participation of the large computer vision community due to high integration costs of a space qualified hardware. The systems used in space are bespoke, and as such, built with processing units almost entirely tailored for each particular sensor suite, and for each particular mission, which is both expensive and time consuming. These components are almost never recycled nor are they upgradable. By creating a Unified 3D Perception Unit as a plug & play core element (or Common Building Block) for systems involving visual navigation, it is expected a substantial cost reduction can be made across the lifecycle from mission concept to mission completion, and which is applicable for several end applications.

Project Aims and Objective

This feasibility study aims to develop the concept for a new and highly innovative idea which is to create a Unified 3D Perception Unit as a plug & play core element for systems involving visual navigation that is fully upgradeable.

The focus of the study is to assess the feasibility of fusing important and non-uniform data flows from diverse sets of active and/or passive optical sensors by a recurrent data processing platform.

Project Outcome

The findings were sufficient to develop the concept as a plug & play core element for systems involving visual navigation. A range of technical designs were identified based on current in use products and their capability and in particular the research focused on the feasibility of fusing important and non-uniform data flow from diverse range of active and/or passive optical sensors by a recurrent data processing platform and the risks incumbent with space applications.