



THE UNIVERSITY
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METHOD & SYSTEM TO DETECT ORBITING OBJECTS

Robust foreground segmentation and image registration for optical detection of objects in geostationary orbit.

Background

Virtually all major public and private assets, such as transportation hubs, commercial buildings, power stations and the like are protected by extensive surveillance networks. The same cannot be said of space assets such as communications satellites and space stations.

There are more than a thousand operating satellites and space installations representing significant investment and providing essential services. As such, protecting these assets from interference and destruction is of utmost importance.

A major risk to these assets is collision with other resident space objects (RSO), including debris and satellites, both operational and disused. As an example, the collision between Iridium 33 (then an operational communications satellite) and Cosmos 2251 (a retired military communications satellite) resulted in over 2000 unregistered pieces of fragmentation debris which have

now drifted and spread to various orbits increasing the risk of further collisions. As such, the assessment of space situational awareness (SSA) has grown in importance with the rapid growth of space utilisation. SSA involves the tracking of artificial earth orbiting objects with a view to determine the potential risk of collision for a particular orbit.

Previous approaches to point-like object detection typically involve first capturing multiple images consecutively in time, and then detecting potential objects, which are usually referred to as “candidates”. There is a need for a method of detecting orbiting objects that can be implemented in generic computer hardware in either ground-based or space-based systems without sacrificing accuracy and the ability to be run in real time.

Technology overview

Our technology overcomes the challenges (objects being significantly distant [hence fainter] and slow moving relative to the observer [e.g. a ground station or an observing satellite]) of detecting objects in Geo-stationary (GEO) orbital band

The technology detects RSO using optical sensors that is applicable for both ground and space-based observations using a novel algorithmic pipeline to perform optical detection of RSO in the GEO.

The technology has superior performance in comparison to other technologies and methods in detecting of RSO in GEO.

IP status

Australian Provisional Patent Application No. 2019900985

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FURTHER ENQUIRIES

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