**CONCLUSION AND FUTURE WORK**

Much of this work was carried out using the development environment for Windows Azure, which includes an emulator that can be run on a single development machine. This is a very powerful tool as we were able to test each worker and the entire workflow using a sample TLE dataset. Once we were satisfied with the results, simply deploying the workers on Azure resulted in a working system which could process complete TLE catalogues.

Further work is required to see how scaling-up can benefit the workflow. Microsoft Windows Azure workers come in different sizes and are billed proportionally. Buying larger, more powerful instances does not always improve the performance at the same rate as the instance cost. This is partly dependent upon the type of task for example, whether it is computationally or IO intensive. It is no longer sufficient to look at overall performance, but rather performance per monetary cost.

The space surveillance and tracking segment of space situational awareness (SSA) system will provide vital security for space assets due to the increased awareness of the risks posed by space debris. The requirements of the SSA system will grow as the population of space objects and the threat they pose increases into the future. In this work, we have shown the relevance of a cloud-based architecture to SSA. In particular, the cloud-based architecture is able to manage unpredictable computational demands, in response to a break-up event, in addition to the predictable requirements associated with the regular processing of a space object catalogue. The solution can grow to include more physical computational and storage resources, thereby scaling with the demands of a catalogue of space objects which is rapidly increasing in size due both to conjunctions which introduce new debris, and the introduction of new measurement hardware which can provide information on increasingly smaller debris.

In conclusion, a cloud based architecture using Microsoft Windows Azure can be successfully applied to an active debris removal mission design task, developed a modular architecture which will be used in the future to support other SSA activities. The modular, cloud-based nature of this solution gives it some unique advantages over alternative architectures due to the rapid availability of huge computational and data storage resources; due to the simplicity that it brings to securely sharing raw or processed data and due to the ease with which it facilitates the side-by-side comparison of alternative algorithms.