Paper ID: 54934
oral
student

IISL COLLOQUIUM ON THE LAW OF OUTER SPACE (E7)
Remediation of Space Debris: A Fundamental Legal Challenge? (7)

Author: Ms. Upasana Dasgupta
Institute of Air and Space Law, McGill University, Canada, upasana.dasgupta@mail.mcgill.ca

REMEDIATION THROUGH USE OF ARTIFICIAL INTELLIGENCE - LEGAL CHALLENGES

Abstract

Satellite remediation has a basic legal problem poses due to the fact that the State of registry continues to have jurisdiction and control over the space debris. Further, there is the question that if another satellite is damaged due to remediation efforts, is the State performing remediation activity responsible? This question is further complicated with artificial intelligence becoming integrated with space technology. At present, this can be done by enhanced self awareness by remediation space objects.

There are two major approaches such as model-based methods and data-driven methods for enhanced situation self-awareness though these methods are still at nascent stage. In model-based methods, models of hardware are provided as input and deviations from the nominal behavior is detected. The models are based on expert knowledge. When applied to the complex systems such as spacecrafts, they may fail to pinpoint all the deviations accurately. Besides, in model-based technique, the model has to be fairly accurate and the complete before useful results can be attained. In data driven approaches, the spacecraft is supposed to autonomously identify suspicious trends in an unsupervised manner as it may be impossible to collect datasets for presentation of all possible fault modes. Therefore, most of the data-driven approaches detect anomalies and off-nominal trends but leave the delicate task of interpretation to humans.

The enhanced self-awareness by space objects can be an asset in developing remediation of space objects and can help in assigning responsibility for the same. This paper will analyze whether it is possible to use artificial intelligence to solve the legal problems posed by concept of remediation of space objects.