

IISL COLLOQUIUM ON THE LAW OF OUTER SPACE (E7)
Space Law in a Networked World (7)

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WHOSE FAULT IS IT? - ARTIFICIAL INTELLIGENCE AND LIABILITY IN INTERNATIONAL
SPACE LAW

Abstract

Artificial intelligence (AI) is increasingly used in space activities, e.g. satellite collision-avoidance and health-monitoring systems, life support in manned flights, etc. AI employs machine learning techniques, mostly in the form of neural networks, which enable the system to automatically improve its performance by exposure to large amounts of data. However, this makes its behavior largely unpredictable, even if all initial programming parameters are known. Such technological developments entail that space activities will be conducted with increased system autonomy. A significant part of the decision-making process throughout the mission will be shifted from humans to machines. Thus, questions arise on how AI impacts the current system of liability under international space law. This paper submits that there will be no problems for cases involving strict liability of the launching State. Nonetheless, cases that require “fault” of the launching State will become (even) more difficult to handle. In general, “fault” may be indicated by non-compliance with established international rules or codes of conduct, by insufficient regard of other States’ interests under Art. IX OST, or by unreasonable behavior. These parameters are examined in relation to AI, alongside with additional AI-specific factors, which might relate to the quality of the training data, sufficient testing of the system (including proper function and interaction among its components), performance of necessary system updates, redundancy of systems, use of systems within their operational domains, possibility of human intervention, resilience in contingencies (e.g. solar storms, function in low power mode), etc. In the event that AI is used to support human decisions through recommendations, then human factors should also be considered, such as appropriate warnings and user-friendly system design. Moreover, explainability of AI decisions is highly desirable, but also hard to materialize owing to the complexity of AI systems. In any case, comparing AI behavior with human behavior should not be excluded, but extreme caution is required, because AI functions differently than the human mind and is meant to surpass human abilities. The paper concludes that no amendment of the current liability rules is required, yet establishing international rules on space traffic management and international, performance-based, space safety standards appears necessary. Moreover, the role of insurance of space activities is expected to increase in importance.