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LEGAL ISSUES OF SPACECRAFT MANEUVERING WITH ARTIFICIAL INTELLIGENCE-
COMPARATIVE STUDY WITH THE JAPANESE REGULATIONS FOR AUTONOMOUS DRIVING
VEHICLES ON THE GROUND

Abstract

What are the legal issues to realize safe operation of spacecraft with Autonomous Intelligent Systems in space? Technological innovations on artificial intelligence-based autonomous systems for space operations are developing rapidly, but the legal infrastructure to solve these issues when spacecraft cause incidents and/or accidents due to autonomous driving has not yet been evolved. When considering new means of resolving legal disputes in space, a comparative study with the legal regulations for automated driving of automobiles on the ground would be helpful. This research reviews the current status of legislation regarding the automatic driving of automobiles, which is being undertaken in Japan and other countries, and examine whether it can be invoked in space. A new safety standards and safety evaluation methods that correspond to the operation of the vehicle (including both ground vehicles and spacecrafts) by the autonomous driving system will need to be set, in addition to the conventional vehicle safety standards that are premised on driving by the driver, for the practical application of autonomous vehicles. For that purpose, the definition of "autonomous driving" must be clarified first. In this study, in accordance with the guidelines formulated by the Ministry of Land, Infrastructure, Transport and Tourism of Japan, the classification (level 0-level 5) of the Society of Automobile Engineering International J3016 is cited as the definition of the level of autonomous driving in automobiles; in order to evaluate that whether this classification, the monitoring entity or the responding entity of safe driving at each level is applicable to the automatic driving of spacecraft. Next step is to give an overview of the laws and regulations of Japan, the United States, China, and Europe that have already been or are being maintained in some jurisdiction for the automatic driving of ground vehicles. This paper will mainly examine the legal liability in the event of an accident, and the means of resolving disputes of those jurisdictions. The final goal of this paper is to introduce the discussions and explore the design of the legal system that eventually can be applied in the event of an incident/accident of an automatically operated spacecraft in outer space. Such discussions may conclude us to add a new definition of the "persons for whom it is responsible" in Article 3 of the Space Liability Convention.