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## UNIVERSAL POSITIONING SYSTEM-THE FUTURE OF SPACE NAVIGATION

**Abstract**

Due to the magnitude of launches in the recent times, there is a significant rise in space debris. With constant improvement in space technology, an increase in the magnitude of space missions is expected. All of these factors lead to more space-borne traffic. This needs to be regulated to ensure safe space travel. This paper proposes a novel methodology for navigation and communication, the Universal Positioning System(UPS). The proposed UPS aims to provide solutions to issues in navigation during situations such as space-emergency docking, mid-way fueling, and trajectory diversion. The technology also aims to be used as a rescue tool for Extravehicular Activity (EVA) during emergencies. UPS uses Application Programming Interface(API) which intends safe navigation through the vastness of the space. Safe travel will be enabled by concurrent charting of the data from the pre-proposed trajectory of the journey, Deep Space Network (DSN), Space Traffic Control(STC), and Artificial Intelligence-powered debris tracking. The proposed DSN allows the space vehicles to precisely target distant bodies and sites of interest on them. STC will be a service provided by the space traffic controllers who will monitor and direct the spacecraft according to the planned objective and provide advisory services in miscellaneous situations. UPS aims to use Space-based Quantum Communication to ensure data safety. All the elements are integrated with the API along with location sensors in every mission-commissioned space-element along with proposed intermediate interplanetary quantum data centers for quick-fetch of the location coordinates. The operations such as docking can be automated and simplified by the fly-by approach, following the communication protocols suggested by UPS. The proposed optimum architecture aims to make the system cheaper, easy, and reliable. The vision of UPS is to make space travel safer and faster in the longer run.