-NOT FINAL DRAFT-

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## Context

The rapid growth of human activity in Low Earth Orbit (LEO) has led to the accumulation of of space debris, posing significant risk to current and future space missions (Kessler & Cour-Palais, 1978). While agencies worldwide such as ESA (European Space Agency) and NASA (North American Space Agency) have recently adopted strategies for sustainability (NASA, 2024) and requirements for debris mitigation (ESA Space Debris W.G., 2023), there is a considerable gap in the public’s accessibility to practical and interactive simulations on the topic. Existing astronaut training tools such as NASA’s JSC VR Lab (NASA, 2023), remain largely inaccessible to the broader public, instead acting as professional training environments for crew members.

While that holds great value in of itself, my research has lead to discovering a gap in the market for a realistic VR simulation of these unique scenarios involving space sustainability and debris in LEO. The emergence of VR devices has created a new avenue for immersive “edutainment” experiences that, distributed properly, can foster greater awareness and accessibility to a realistic space environment in a modern setting.

### VR as an Edutainment Medium

Education mixed with entertainment – commonly referred to as “edutainment” (Aksakal, 2015) is a powerful tool, if used correctly. In this project, I wish to demonstrate the use of VR as an edutainment medium, applied to a specific area of science. There are many different examples of VR games as edutainment, and one specific to this area is Mission: ISS (Oculus, 2019): it provides users the ability to spend some time in the shoes of an astronaut of the International Space Station (ISS), with realistic and detailed environments and guided “spacewalks” by actual astronauts. Its main strength lies there, in its authenticity, being supported by NASA astronaut commentary. It provides great insight into what zero-gravity is like to move around in, even if only a simulation. It also gives a glimpse into the life of an astronaut, and their responsibilities atop the ISS.

### Space Debris Simulations

### Existing Space VR Games/Simulations

-Mission: ISS

-Adrift

-Lone Echo

REferences

Aksakal, N. (2015) ‘Theoretical View to The Approach of The Edutainment’, Procedia - Social and Behavioral Sciences. Elsevier BV. Available at: https://doi.org/10.1016/j.sbspro.2015.04.081.