

IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)  
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HARMONIZING INCLUSIVE EDUCATION AND EXPLORATION: A MULTISENSORY JOURNEY  
INTO THE RINGED PLANETS OF THE SOLAR SYSTEM

**Abstract**

This paper introduces a novel educational tool designed to enhance comprehension and engagement with the intricacies of the ringed planets of the solar system. The project is intended to work as an assistive technology; these applications have proven to play an important role in supporting people with disabilities and frailties by focusing on enhancing accessibility and inclusivity, particularly in the global space education, which covers the Sustainable Development Goal of Quality Education (SDG 4). The tool integrates advanced visualization and sonification techniques, offering users a multisensory experience aimed at facilitating deeper exploration and understanding of planetary phenomena. By leveraging sophisticated algorithms and data processing methodologies, the tool provides visualization of celestial bodies and their orbital dynamics, allowing users to interactively manipulate parameters and observe resulting effects. Additionally, through the integration of sonification, the auditory representation of astronomical data enriches the user experience.

As the project is ongoing, the sonification of objects will be performed using images of the ringed planets obtained from NASA's image library as a database of X-ray images captured from ringed planets. These images will undergo a frequency assignment process to generate corresponding sounds, assigning low tones to dark parts and higher tones to lighter parts. The program will be developed using Python programming language, NASA's image and video library related to the purpose of this study will be used, as well as sounds obtained through the object sonification due to radiofrequency reproducing visually and aurally the planets of the solar system that have rings, likening the planets to a turntable and their respective rings as vinyl records.

As this work is intended to be demonstrated in an astronautical congress, people will be able to appreciate the program running through a projection with sound carried out at the stand, using a projector device, a white screen and a speaker.

The synergy between visualization and sonification not only enhances comprehension for various learning styles but also opens up new avenues for inclusive education, breaking down barriers and making the

wonders of the solar system accessible to a broader audience. Beyond its educational implications, this tool stands as a testament to the power of technology in fostering inclusivity and expanding the horizons of scientific exploration for all which represents an obligation for everyone involved in the scientific field.