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Contemporary Arts Practice and Outer Space: A Multi-Disciplinary Approach (3)

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THE UNSEEN WORLDS: USING FEATURE FILM TECHNIQUES FOR SPACE MISSION PLANNING

Abstract

Hollywood plays a large role in entertainment and culture. It has cultivated artists that can visualize and create worlds that do not exist. These images are hyper realistic, using textures and patterns from locations on Earth. While concept artwork is largely done for entertainment purposes, NASA also uses artists to visualize mission destinations before real images are obtained from spacecraft. These images primarily serve as public relations and media material and do not contain much scientific information.

Artists have the ability to create a realistic portrayal of a remote celestial body, based on available scientific knowledge and some speculation. The paper describes techniques used by concept artists when designing an unseen world. Specifically, the case-study explores the Matte-Painting process and research done by the artist when developing the environment. The paper showcases drawings from work on the Rosetta mission to target comet 67P, Churyumov-Gerasimienko. Furthermore, the artwork is compared to actual images of the comet taken by Rosetta and Philae. The quality of predictions is discussed in addition to deviations. The paper also provides concluding remarks on best practices relating to collaboration between concept artists, scientists and engineers in order to help visualize target destinations earlier in the design process.

The case study illustrates the process taken by an artist in addressing technology challenges to enable breakthrough science and visualize mission concept design. At the beginning of the work, the target comet was seen as a single pixel in the lens of the most powerful space telescopes, such as the Hubble Space Telescope. The artist was to visualize unknown terrain in a way that could influence orbiting and landing operations, and inspire dialogue amongst the mission design team about appearance of rock formations and other hazards.

There was a risk factor associated with this work. Accurate portrayal of morphology and geology of the target body would be beneficial in planning of the mission. However, inaccurate visualization from the artist could result in misleading scientists- referred to as the "Charles Knight Effect," based on the painter who created images of dinosaurs as lizard-like creatures, instead of bird types. Due to Knight's inaccurate drawings, difficulties adjusting to the featherier reality are still evident today.

Ultimately, the art was a tool for the scientists and engineers to envision the destination, and design optimal operations of the spacecraft and its scientific instruments.