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### Internship in Augmented and Virtual Reality - Rapid Model Import Tool

The integration of virtual and augmented reality, sometimes called mixed reality, is an emerging technology which will likely skyrocket overnight much in the way smartphones did a decade ago. Kennedy Space Center's Augmented and Virtual Reality (AVR) Lab is developing a Rapid Model Import Tool (RMIT) to create a quick and efficient way to bring NASA's complex engineering 3D models into virtual and augmented environments. The long-term objective is to create a tool that will ultimately benefit KSC engineers. Its various uses within NASA can potentially span from astronaut training, to marketing, to public outreach, to name a few.

Unity is a prolific cross-platform game engine that allows users to build high quality 2D and 3D games for desktop, mobile, web, and game console platforms. It is perhaps also the most widely used software for virtual reality game development. At the AVR lab, we are looking at alternative uses of Unity to build tools for NASA engineers to perform design, development, testing, and training on spacecraft, rocket delivery systems, ground support equipment, and facilities at KSC.

As an intern for the RMIT project, I am charged with the task of performing research on Unity-compatible file types to develop an efficient, affordable, preservative process to bring models from CATIA 3D engineering software into the Unity environment. With a tool called the NASA Enterprise Visualization Application (NEVA), developed by the Boeing Design Visualization group at KSC, we are able to easily convert CATIA's design models to .DAE (also known as COLLADA) and .OBJ file formats. I first reduce the polygon count of the model within CATIA itself, make any necessary tweaks to reduce the model further, and then export using NEVA. The .OBJ or .DAE files that I am left with are then converted by another intern to a Unity-compatible file format using a custom Python script. I have generated extensive documentation of this process in a NEVA User Guide. By the end of this semester, we will have built a solid framework for RMIT based on a thorough understanding of virtual reality specifications and file requirements, allowing future software development teams to go forward with development on the custom tool.