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STATEMENT OF PURPOSE:

NASA's Earth Observing System Data Information System (EOSDIS) and specifically the Global Imagery Browse Services (GIBS), provides access to over 700 satellite imagery products. While there are a vast amount of satellite imagery data sets available, it is not always easy to visualize and interact with them. Web applications such as Worldview, also from EOSDIS, allow users to overcome this issue by providing the tools to visualize, interact with, and download data sets. While these applications are extremely useful, the emerging technologies of Augmented Reality (AR) and Virtual Reality (VR) present a unique opportunity to enhance user engagement, data visualization and data interaction. This presentation will focus on a case study of an AR application, Worldview AR, to help the audience better understand how these emerging technologies can benefit scientists and students in the future. Worldview AR is an application that capitalizes on the benefits of AR specifically for satellite imagery. This application was developed for commodity tablets and smartphones to maximize accessibility to the public. By ingesting satellite imagery from GIBS, Worldview AR is able to display numerous data sets mapped to a spatially located map and globe appearing in the real world. Interaction tools such as a color probe, data set comparison and magnifying glass are included to help users understand these data sets in novel new ways. The user is able to physically walk around the globe and map to gain addition perspectives while sampling and comparing the data as necessary. In addition, a gamified trivia mode was developed to provide a guided experience for outreach purposes. Players are directed to the correct data set and tool to answer questions in a fun and intuitive manner. Furthermore, multiple players can compete against each other in shared environment resulting in increased engagement. Due to the nature of AR, players are able to have a shared experience in the real world that could not be duplicated via tradition 2D displays. Through augmented and virtual reality, scientific data may be visualized and interacted with in ways never before possible. The project described in this presentation will demonstrate one specific application and the vast benefits it can bring to earth science data visualization. However, it is important to remember that these technologies are still relatively new and there are limitless possibilities that may come from them in the future. Therefore, it is critical that scientists understand the scope and capabilities of AR and VR to maximize its potential for use in science.

DESCRIPTION OF DATA SETS:

NASA's Global Imagery Browse Services (GIBS) provides access to over 700 publicly available satellite imagery data sets. These data sets include imagery for a vast amount of earth science data including sea ice coverage, earth at night, land temperature, human impact, color reflectance and many others. Depending on the data set, data is available as recent as within 3.5 hours of observation all the way back to 20 years ago. The imagery included in these data sets are broken up into tiles providing varying levels of resolution. An addition description and list of all the data sets can be found at:
<https://wiki.earthdata.nasa.gov/display/GIBS/GIBS+Available+Imagery+Products>