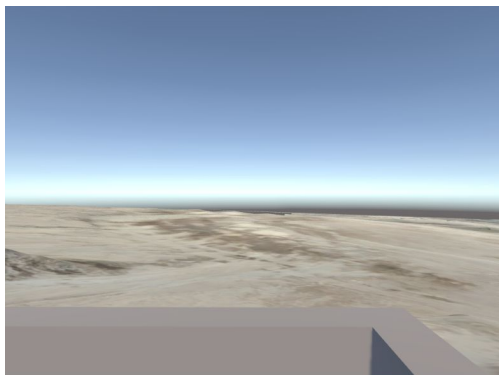


**Representation of Ancient Archeological Site Data:  
From 2D datasets to 3D Virtual Environments  
Laura Friel, Class of 2022**

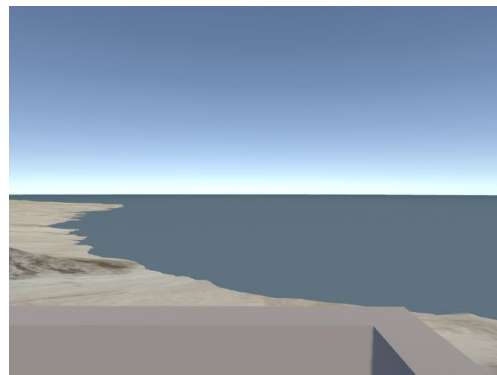
Gaining insights into an archeological site, such as who was there, when, and why, are key to interpreting a site and its occupants. The method used to answer these questions is manual excavation of a site, where archaeologists' findings are recorded with photographs, level sheets, etc. This form of data collection translates three dimensional data into two dimensional representations and, though the data and accompanying notes are extensive, there remains a challenge when interpreting two dimensional data back into three dimensions. Cognitive limitations and sheer mass of data make it challenging for both archeologists and the general public to visualize data, limiting its accessibility.

My summer was spent at the Virtual Environment and Multimodal Interaction (VEMI) Lab at the University of Maine with Emily Blackwood, a current doctoral student and senior logistics coordinator at the VEMI Lab. During my time, I quickly learned skills to develop environments in virtual reality and used data Emily had collected one year prior to create a virtual representation of an ancient site in Peru, which was active roughly 6,000 years ago and is potentially the oldest defensive site in the New World. This data included drone images and heightmaps, photos taken from an iPhone 6 (to accurately texture the environment and model level excavation), historical water line records, and more traditional archaeological data such as level sheets.

It is now possible to virtually 'stand' on the hill where an old structure was located and look around on the landscape/terrain as it would have been 6,000 years ago. The drone data collected was used to create a detailed model of the area around the site. The ocean was added as well as an accurate model of the Andes in the background (not pictured). In addition to the construction of the virtual environment, I also create a simulation of how the granite structure located at the site hypothetically could have eroded due to wind. Lastly, I created a system to see the different strata of an archeological dig (below ground), which was a previously unexplored use of virtual reality in archeology.



Virtual Peru Site before addition of water (current day, Ocean 5 km to the West)



Virtual Peru Site after addition of water (~6,000 years ago)

**Faculty Mentor: Stacy Doore**

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