Smart Classrooms for Global Archaeology: San Diego – Haifa Virtual Collaboration

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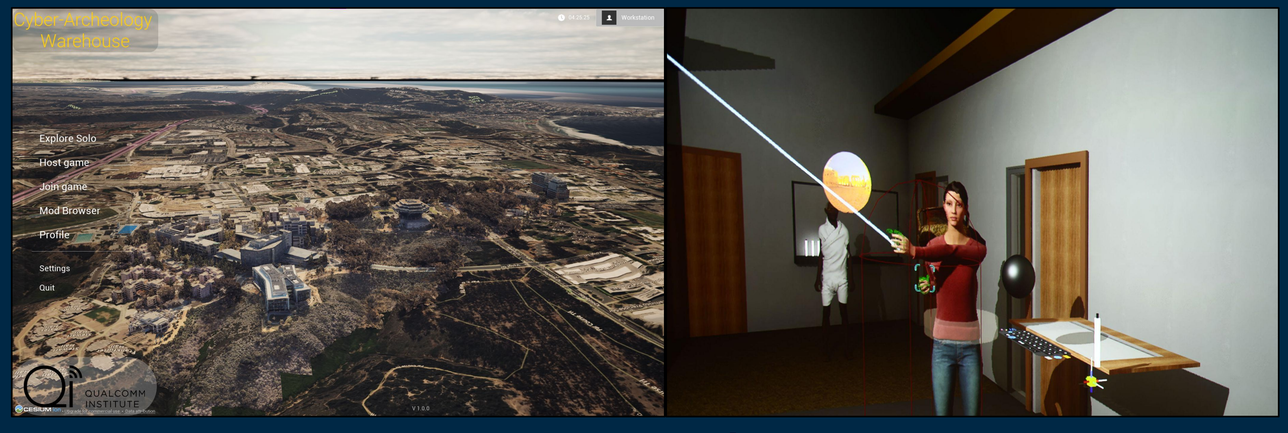
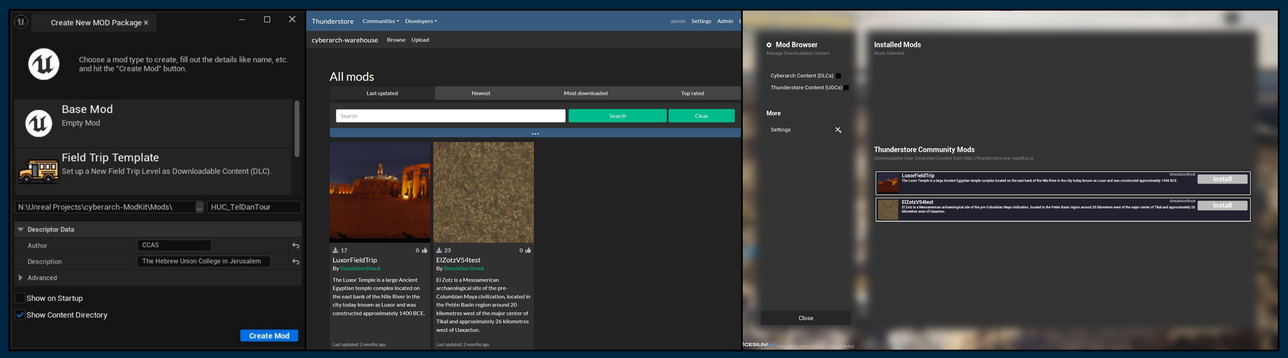
Introduction

To enable collaborative analyses between UC San Diego and the University of Haifa, core multi-player tools have been developed. Beyond just studying within a single location, we have the ability to take virtual tours together across the entire coast of Israel. The Smart Classroom is a collaborative tool where up to four users can access shared data stored simultaneously in Haifa and San Diego. Instead of just video conferencing, avatars with full body and facial tracking provide shared presence inside simulated environments where archaeological artifacts scanned in high precision can be studied. For supporting a network of institutions interested in integrating their own data, a Software Development Modkit for Unreal Editor is being explored.



Approach

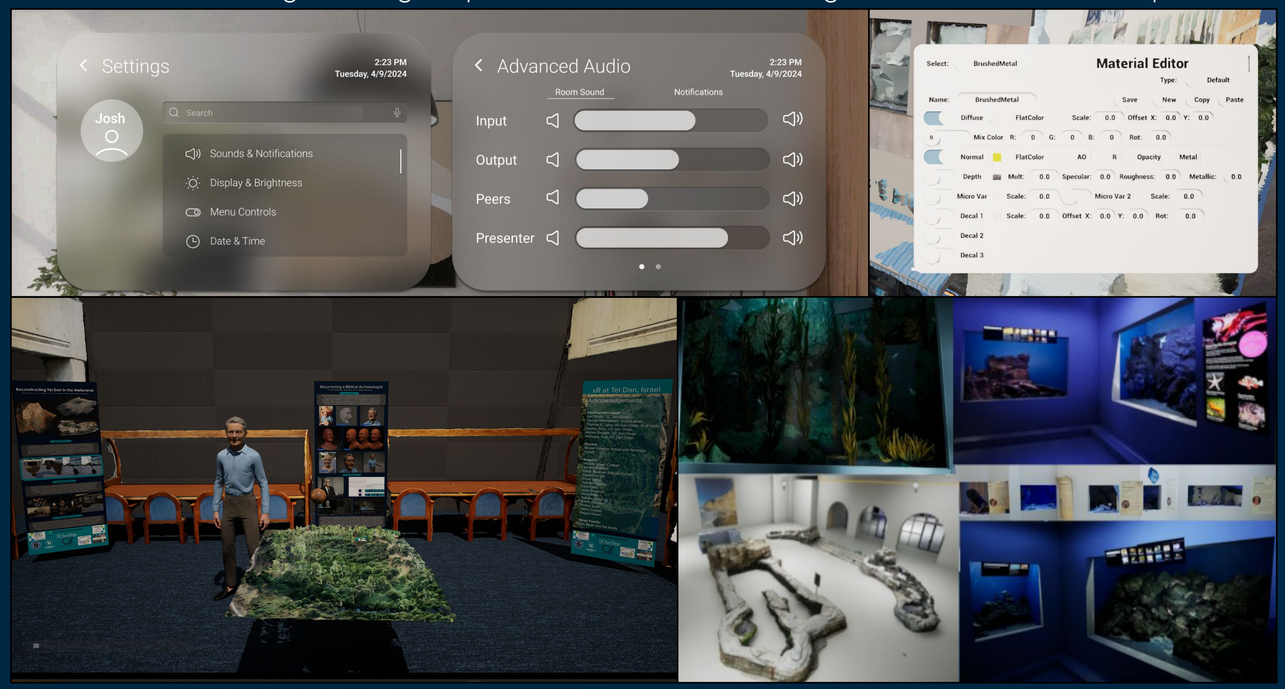
Tools and methods for authoring new content are distributed by our Software Development ModKit, enabling the user community to customize and share immersive educational experiences by leveraging the gameplay features provided by the core application. The Cyber-Archeology Modkit provides a platform for developers to Create, Package, and Upload Mods that encapsulate rich environments with interactive guided experiences for expanding the Smart Classroom. The open-source Thunderstore mod database and API provide the web services required for uploading mods and installing them with a mod browser built into the Smart Classroom Application. With this strategy, we take techniques typically used for entertainment and apply them towards cultural heritage preservation, archeological research, and education.



Starter Mod Kits **Thunderstore Mod Database** **In-Game Mod-Browser**

Applications

Using the ModKit, Content from Prior Projects such as Digital Twins of the Hebrew Union College Museum in Jerusalem or a Professor Avraham Biran Guided tour of Tel Dan's archeological structures can be later Integrated into the Smart Classroom. Other examples from prior projects include the Birch Aquarium at Scripps, and various climate change themed projects created by students of the UC San Diego 7th College Synthesis 100 Course. The ModKit will make it easier for users of various backgrounds to make their experiences readily available with the broader community. Another application available to all modders is a new UI/UX approach called Spatial Widgets. These are true 3D widgets that use modern styled themes (e.g. Neumorphism and Glassmorphism). The widget dynamically reshape 3D meshes and allow for physics based collision enabling users to grab, push, and interact with the widgets in VR or from the desktop.



Future Work

The Cyber-Archeology Modkit Editor currently packages and uploads only for the Windows Platform. Further work needs to be done to support Linux, IOS and Android.
Our self-hosted instance of the Thunderstore Mod database and API will eventually support all devices and OS's allowing for a seamless use.
Now that the initial tools are built, we hope to expand the Smart Classroom to be a tool for many archaeological sites and used by the archaeological community as a whole. If your university or program is interested in contributing to the project with your own mod levels you can contact Dr. Neil Smith by email: ngsmith@ucsd.edu.

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