Project description (please give a few paragraphs that cover the basics... the application domain, do you see this as a web application, mobile, app, etc., who will the software serve, what problem will it solve for them, are there other systems that it must interact with... etc.).  The more information you can provide here, the better we can evaluate the suitability of the idea for a team in this course.\*

Swayambhu Stories: Visualizing Religion and Heritage in Nepal

This project is a joint endeavor between Lauren Leve, Associate Professor of Religious Studies at UNC and Baakhan Nyane Waa (“Come Tell Stories” in the Newari language), a small NGO formed by Nepali cultural heritage activists based in Kathmandu. Members of Baakhan Nyane Waa are architects, engineers, artists and filmmakers who came together to help reconstruct a major cultural site in Kathmandu that was destroyed in the 2015 earthquake. Professor Leve is an expert on Himalayan Buddhism and Nepali Buddhist culture. They met in the summer of 2018 when Professor Leve traveled to Nepal to create 3D models of Buddhist temples in the Kathmandu Valley. This meeting led to a plan to create a high-quality 3D model of [Swayambhunath stupa](https://swoyambhustupa.com/) (“The Monkey Temple”), a UNESCO World Heritage Site and one of the most important Buddhist monuments in Asia, and to annotate it with audio, video, photos and text showing its many meanings to the diverse communities in Nepal and beyond for whom it lies at the center of their religious and cultural lives.

For example, a visitor to the site could click on a prayer wheel and hear an old man talking about visiting the stupa as a child with his grandfather, what it was like then, and how he loved to spin the prayer wheels while his grandpa did his prayers. Or they might click on another prayer wheel and read a short text explaining what a prayer wheel is and what the karmic benefits of rotating them are. Then, they might click somewhere else and see a priest telling the story of how a Buddhist deity created monkeys at the temple out of the lice in his own hair. Etc.

Professor Leve and her partners spent two months in summer 2022 using drone-based video data to construct a preliminary 3D model of the monument site and recording interviews with Buddhist monks, priests, scholars, musicians who perform as part of rituals at the site, and visitors who travelled there for purposes ranging from fulfilling familial religious obligations to divining the fate of their bid for an Army job, to hopes of filming a viral TikTok. Together, the 3D model and archive of interviews recording the history, practices, and people’s personal reflections on, memories of, and affective investments in the site will be important records of the tangible and intangible heritage of Nepal, which will preserve vital knowledge of both cultural practices and the built Buddhist environment into the future. This is a crucial need given that the Kathmandu Valley is still geologically active with more earthquakes expected, and considering the rapid pace of cultural change, which is impacting religion as well as everything else.

The project we are requesting help for is a web application to visualize the 3D model and annotations (text, photos, audio and videos). At this point, the priority is that it be viewable on computers but eventually we’d like it to be compatible with mobile phones also. The application should have a VR option so that viewers can have a fully immersive experience. It should be programmable to allow viewers to navigate the site as if they were there in person, which means preventing them from walking through walls, statues, etc. It should allow the annotations to appear as pop-ups within the main scene.

In the fall of 2022, a COMP 523 team took this on and built a sample environment using Potree. This provided a highly useful proof of concept and initial practical experience. (See <https://tarheels.live/teamd/>). In the end, however, the COMP 523 team concluded that Potree was not the best program for this project’s needs and Prof. Leve and her partners in Nepal agreed. The 2022 COMP 523 team suggested that a future team consider a second build using UNITY.

What we’re hoping for this semester is a team that can help us take the next step. Our current model is frustratingly low-res because of limitations of the drone-capture. In October, Professor Leve will be returning to Nepal with a LiDar scanner and cameras to capture much higher quality data for a professional quality model. Our wish is that when this data has been processed (hopefully by the end of November), we’ll have a suitable environment to locate it in.

For some idea of what we’re imagining, see <https://artsexperiments.withgoogle.com/bagan/>.

We do not want to create a narrated tour. But we will have similar quality data to visualize and also want annotations, including audio.

We are looking for a team to help us build an environment that will optimize the data to create the best possible user experience when navigating the site, that will facilitate annotation and other web links, and which will support--or can be adapted--for VR experiences.

This application will be accessible to people around the world who are interested to know and learn about the heritage site. It will enable people to travel virtually from the comfort of their location.