Baker/Koob Endowments - Final Report

Title of Project: Utilizing AI to Share the Research and History of Swanton Pacific Ranch

Project Completion Date: 10/17/2022

Student Names and Majors:
Evangeline Barruel, Computer Engineering
Norman Chang, Computer Engineering
Edik Chekhanovsky, Computer Engineering
Lolia McCoy, Computer Engineering
Melissa Wesolowski, Computer Engineering (Project Lead)

Faculty Advisor and Department:
Jeanine Scaramozzino, Library Academic Services

Cooperating Industry, Agency, Non-Profit, or University Organization(s):
N/A

Executive Summary: Since the CZU Lightning Complex fire of August 2020 burned through most of the buildings and historical data that resided at Swanton Pacific Ranch (SPR), finding a new way to share the land’s rich history has become imperative. The purpose of our project was to do just that. We aimed to create an interactive chatbot called “Poppy” that could be accessible both online and at SPR, allowing users to learn more about the ranch and its surrounding areas. This chatbot allows users to explore a multi-level map of the ranch, ask any questions they may have about the ranch, and provides a place for users to donate to the ranch’s recovery and future development. The physical chatbot that will reside at SPR is fully self-sustaining; housed in a weather-resistant shed and fully solar-powered. It allows visitors to the ranch full access to the web application via a touchscreen monitor. Our project is the first fully functional version of Poppy the Chatbot, and it will serve as the foundational piece from which future teams will be able to easily expand and improve.

Major Accomplishments:

Web Application: Poppy the Chatbot is now Google Cloud web hosted on swantonpoppy.org. The web app features a chatbot that gives responses from an AI that is still under development by a Computer Science graduate student. It also features a map of SPR and opportunities to learn more about the ranch and the overall Cal Poppy research project on SPR led by Jeanine Scaramozzino. Additionally, the chatbot can take speech input and read messages aloud.
**Kiosk Interface:** Poppy will also be available to visitors on the ranch through a kiosk that runs the web app. The kiosk features a touchscreen for users to interact with the chatbot and is powered primarily through solar power. It also has a microphone and speaker for future iterations to make use of when text-to-speech and speech-to-text features are implemented. There is also a 14TB external hard drive to support future local hosting of the web application and storage of SPR data for chatbot queries. With the help of CSM staff, the physical kiosk is now fully assembled. The kiosk will continue to be housed at Cal Poly through the summer while further testing and final touches are being done. This coming fall, it will be taken up to Swanton and fully installed on the ranch.

**Expenditure of Funds:** Below is a breakdown of how funds were used to complete our project.

| Student Applicant(s): | Evangeline Barruel  
|                       | Norman Chang  
|                       | Edik Chekhanovsky  
|                       | Melissa Wesolowski  
|                       | Lolia McCoy  
| Faculty Advisor: | Jeanine Scaramozzino  
| Project Title: | Utilizing AI to Share the Research and History of Swanton Pacific Ranch  
| Travel | **subtotal $709.62**  
| Travel: In-state | $709.62  
| **Operating Expenses** | **subtotal $3636.80**  
| Non-computer Supplies & Materials | $650.11  
| Computer Supplies & Materials | $2949.17  
| Printing/Duplication | $37.52  
| **Contractual Services** | **subtotal $149**  
| Contracted Services | $149  
| **TOTAL** | **$4495.42**  

**Impact on Student Learning:**
The team of Cal Poppy worked together on this project for a whole school year, and through this time, the experience has proved to mature our skills that are applicable to our careers. Our hardware lead, Melissa Wesolowski, enjoyed her experience with embedded systems during Cal Poppy. This project helped make her realize her passion for the subject which is the field that she entered upon graduation. The experience that we gathered from this time spent has helped us gain better knowledge regarding React applications and building websites which is information that we can all see ourselves applying in the workplace.

While our newly found proficiencies are more technical in nature, we all learned how to work with a team as well as how to communicate with our client, CSAI (Cal Poly Computer Science and Artificial Intelligence Club) members, and other students, staff, and faculty working on other branches of the larger project collaboration. While communication is important within a team, being able to convey the work done to the client and understanding what our client wants was even more important than any technical level skills. Having meetings twice every week helped the team and the client communicate what each member was working on and this helped allow the client to feel more involved with the project. One example was when Evangeline and Norman worked on the text-to-speech software and hardware respectively alone, these meetings allowed both of them to work on different portions but understand the progress of the other partner. This project only not helped the team hone their technical skills but also introduced everyone to the dynamics of working together in a team.