

Face-to-Face With History: Restoring Forgotten Voices through An Interactive Avatar of Elizabeth Jennings Graham for Museum Education

Face-to-Face with History examines ways in which artificial intelligence can be utilized to bring back into view forgotten historical narratives through engaging, interactive museum experiences. The subject is Elizabeth Jennings Graham, a 19th-century Black civil rights activist and educator whose 1854 court victory led to the desegregation of New York City's public transportation nearly a century before Rosa Parks and the Montgomery Bus Boycott. Despite her importance, Graham's story remains largely absent from mainstream museum exhibitions and NYS curricula. We present the design and implementation of the web-based AI-driven avatar that allows Long Island Museum visitors to ask Graham spoken questions and receive historically grounded, conversational responses.

The project combines the power of speech recognition, natural language processing, semantic similarity modeling, knowledge bases, and audiovisual generation techniques. User input is obtained using browser-based speech recognition technology, then analyzed via a hybrid interpretation technique that combines semantic matching and rule-based logic for accuracy, which is a requirement particularly suited to the accuracy needs of an educational platform like this one. Output is rendered in the form of a realistic animated portrait via neural video synthesis and text-to-speech models, animated in the style popular in the mid-19th century. Content was also generated using a specially created dataset, drawing from primary sources, the New York State Social Studies standards, and linguistic studies for maximum authenticity within the scope of the student user.

A working prototype is currently on [Github](#) and proves the capability to enable end-to-end conversational interaction. Some preliminary results also include the integration of speech input, response-matching, and avatar functionality. Interface mockups for kiosk-based museum installations are also included, as well as QR codes for smaller museums. Current work is focused on improving the prototype, and future work will include optimizing speech input in the noisy setting of a gallery environment, user testing with museum educators and student groups, and the evaluation of the efficacy for learning outcomes and visitor engagement.

Additionally, this project is relevant for this symposium's focus on artificial intelligence because the project involves the application of multimodal AI systems for cultural heritage, human-AI interaction, and education. In essence, the project introduces the application of AI systems as a tool for restorative stories to replace merely static exhibitions and convert them to a living dialogue. The ultimate aim is to build on this project to create an open-source tool that will allow small and mid-sized museums across New York State and beyond to apply this technology to tell stories of other overlooked historical figures.

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