# An Educational SARS-CoV-2 Genome Browser

**BIOE485 Capstone Team 5**

## Abstract

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**Abstract**

The COVID-19 pandemic has drawn increased attention to the persistence and dangers of misconceptions, miscommunication and misinformation. These are social issues that cost the unnecessary loss of many lives over the past year, and continue to do so across the globe. This project was pursued in response to a need for strategies to more effectively communicate relevant scientific knowledge and research to the public. The approach this project took was to create a fully-functional, easily navigated, Educational SARS-CoV-2 Genome Browser within an educational SARS-CoV-2 resource website. The intended audience of the browser are high-school and college-aged students within biology-related course settings, potentially introduced by educators as a teaching tool. Through this avenue and other sharing platforms (news media, social media, internet searches, etc.), it is expected that the project will be able to gain attention and serve as a resource among interested members of the general public as well. The browser was created using the GBrowse browser creation platform, hosted on an Amazon Web Services (AWS) EC2 instance. The uploaded SARS-CoV-2 genomic reference sequence was retrieved from NCBI. The browser features key tracks including proteins of interest, variant mutations and restriction sites. The resource website was generated using WordPress, hosted on an AWS Lightsail instance. It features web pages explaining the biology of SARS-CoV-2, closely linked to the tracks displayed on the browser, alongside relevant public health information on COVID-19 such as vaccination and mask usage. A glossary and educational videos within the resource website further encourage users to learn new biology topics. Navigation between the browser and the resource website are facilitated through pop-up balloons on the browser and hyperlinks within the website. The prototype was launched for testing and feedback has been collected from over 40 students and educators. User experience within the site is being tracked by Google Analytics, which monitors the site's user traffic. This data will be used to further improve the functionality of the browser and resource website. Certainly the project is untraditional with respect to past years' Capstone projects, but a coding-based project allowed the team to adapt to the constraints of a virtual learning environment, successfully delivering a prototype that has already been implemented within course settings.