COVID Lens - Technical Report

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Abstract

COVID Lens is designed to be an iOS application that allows members of the UNCG community to stay updated on the latest virus-related stats/news regarding the university and serves as a tool that promotes safe and healthy practices to its users. The app, while currently only designed for iOS users, is robust in design with services created to be easily deployable to other mobile OS. As of now, the main features included are the following: An Interactive COVID-19 Case Map, Self Report Form, Statistic Summary Table of Cases, and a Helpful Resource List.

Introduction

During the early stages of development, we planned to create a data-driven app that would provide users with reliable information to keep them aware and informed about the current pandemic. Our group focused on each of the necessary subsystems of the application in order to produce our final product and coordinated our work by performing bi-weekly meetings. As a result of our ambitious efforts, COVID Lens met and exceeded most of our expectations.

Architecture

In designing COVID Lens, our development team decided to utilize a variety of different tools and programming languages. Each of the development tools were chosen because of their unique properties and known capabilities. For frontend development, we opted to use SwiftUI, Apple's fairly new framework used for creating simple but elegant user interfaces. For our application logic, we used Swift because it is the newest language for native iOS development (not to mention its speed in comparison to other languages). It should also be noted that the development of this application was done using Xcode (Apple’s development environment). For our server-side development, we decided to use PHP. We chose PHP primarily because of its flexibility and its popularity as a tool used for developing web applications and RESTful APIs. For data analysis and calculating our statistics, we decided to use Python. Since Python is a very popular language commonly used in Data Science, we decided that it would be a good choice for the purposes of our project. For storing and managing our data, we implemented a MySQL database. This choice for database management was mainly because of the desire to maintain a relational database structure.

Design Considerations

In this project, we proposed that the app should be able to provide users with meaningful information related to the current pandemic situation. The security of all users should be highly prioritized, especially for those who willingly submit anonymous self reports. Another purposeful design that we considered was the layout of the graphical user interface (GUI). We

implemented the GUI such that any inexperienced user would be able to easily understand and navigate our application.

Conclusion

Our group was able to successfully implement the primary features that we had initially proposed. We have included several features, all of which we believe will be beneficial to our users. For users living on UNCG's campus, our interactive map provides a way to determine which residence halls are likely performing safe practices (and which are not). Our running tally of confirmed COVID cases allows administrators to quickly assess how well or not particular locations on campus are following safety precautions. Furthermore, the design of our application is user friendly and provides easily accessible information and resources. For these reasons, we believe that our project has been a success.