PRATHAMESH BRAMHANKAR

CS SENIOR DESIGN

ASSIGNMENT 3

**Capstone Project Assessment**

Our project will focus on capturing data for the amount of rainfall experienced by the University of Campus alone rather than the whole Cincinnati area. This will allow us to have more accurate data and focus on analyzing this data and thus denoting what structures would be safe to use and at what times. These time estimates would be calculated by taking the material type data from the user and combining it with the rainfall data on campus calculated by our sensors. The rainfall data will be recorded by the sensors, and then it will be processed using java, c# or python and sent to the online database using sql. Then the data will be displayed on the website and a mobile app. The website and mobile app will have feature to enter the material type data and even optional parameters like size and force exerted by the user which will be used to present erosion and safety data.

Throughout my college experience, I have had multiple projects and classes that have helped me prepare for this project. Classes like Models 1 and 2, Engineering Foundations and Programming languages taught me how to divide work and coordinate with your group to come up with the most effective results. Python programming introduced me first time what it is like to code a complete new project which made me understand how to come up with effective and cool ideas for a new project. Data Structures taught me when and where to use what type of data structure so as to make my program have closest to optimal runtime. The UC revolution 2016 hackathon where my team won the best mobile hack taught me how to incorporate databases with android and iOS apps which will now help me when coding the mobile apps for our project.

I have had 3 different coops which have each taught me different things which together sum up a great experience for me. My first coop taught me how to code scripts and automate stuff using python and also how to build iOS apps using Swift which is easier and better for coding iOS apps. Both these knowledge experiences will help me with coding the iOS app for our project and even analyzing data using python if we choose to use it. My second coop was a research coop where I used C++ to build a driving simulation for a simulator in Unreal engine. This research coop taught me how to go about creating something completely new without using APIs and pre coded environments which will be helpful when we start with our project. My third and final coop taught me how to code in C# as I expanded an application for a company and made their whole quality control data recording digital. C# is one of the options for us to use for analyzing the sensor data and the coop experience might come into play if we go with it.

Our team is motivated and looking forward to help the architecture and construction crews with this project. Our final product will allow them to ensure the safety of the structures they design, create and build. The rainfall data just for the campus of UC will give us a more generalized and accurate data to be able to estimate the amount of erosion experienced by various buildings and structures on campus. This will help the architecture and construction crews improve on the safety of the structures. The project will involve sensors calculating the amount of rainfall every fixed amount of time and then using an Arduino board and Wi-Fi modules to send this data to a server. This time will automatically change if the depending on the amount of rainfall. Once on the server, this data will be stored to database using MySQL or similar language. Then this data will be extracted and analyzed using python c# or java or even multiple languages. This data then will be presented on a web browser and mobile apps where user can even set parameters like average amount over a time, etc. The user can also enter material type data and even other optional data to check safety of structures by calculating erosion data due to rainfall.

Our expected results and accomplishments will be a web browser and mobile apps where students can view our rainfall data on the UC campus in different ways. We also want to provide a separate way for the architecture and construction crews to give them this data and also let them put their own data to ensure safety of the structures they design and build keeping erosion due to rainfall in mind. We expect to give them alerts of a timeframe where the structure is safe to use. We expect all of us to contribute in every part of the project as all of us know and are capable to code every part of this project. The evaluation of the contributions will depend on how we divide the work later and how everyone keeps up with their personal deadlines. Once we a have a web browser and mobile apps for students to view data of rainfall on campus in various ways by adjusting parameters and construction and architecture crews can use our and their own data to check the safety of their structures, we think that would be a great milestone for us to say that we did a good job.