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HON 113
“Code Blue”
Abstract
Anyone can be a victim of cardiac arrest and people die because they do not get some form of CPR in time. Luckily, in America it is very common for bystanders to call in and report cardiac arrest victims. However, only 32% of cardiac arrest patients get Cardiopulmonary resuscitation (CPR) assistance from bystanders, yet over 12 million people are CPR certified (American Heart Association). What appears to be happening is there are people who are CPR certified but most of the time the people who first encounter the victim tend not to be CPR certified. In addition, it seems as if these people are first on the scene are not able to get in contact with nearby CPR certified citizens. This means that the only current option for the people first on scene who are not CPR certified is to call 911 and wait for Emergency Medical Services to arrive. Working under the assumption that there are nearby CPR certified citizens, which is highly likely given that so many people are CPR certified, a proposed solution would be a mobile application or website that would allow for people who are first at scene to find the closest CPR certified first responders and broadcast their location to them. These CPR certified users can then respond to this call for help and get to the victim quicker than the Emergency Medical Services (EMS).

Users
This application targets people who witness cardiac arrest, but do not have the skills to perform CPR and people who have aforementioned skills, but unaware that there is someone in the area who needs CPR performed on them. There are 383,000 out-of-hospital cardiac arrests every year in the United States. And nearly 60% of all cardiac arrests are witnessed meaning that nearly 230,000 people could be resuscitated early and have a better chance of survival by a bystander (American Heart Association). However, as mentioned earlier in this paper only 32% of cardiac arrests patients get help from bystanders meaning there is a disparity between witnessed cardiac arrests and those that actually perform CPR. This is most likely because four out of five cardiac arrests happen at home where it is hard to easily get in contact with people outside the immediate vicinity (American Heart Association).

So What
A problem plaguing our society is the amount of people that die because first responders are not able to get to the victim in time and perform CPR. Less than “[8] percent of people who suffer cardiac outside the hospital survive” (American Heart Association). This means that 92% of the 383,000 people who suffer cardiac arrest in a year do not survive. It is idealistic to believe that everyone who suffers cardiac arrest can be saved, but immediate CPR after cardiac arrest can double or triple a victim’s chance of survival (American Heart Association). However, many victims have to wait about 8 minutes on average for EMS to arrive (Neukman, Grasner and Schewe). While 8 minutes does not seem like a significantly long period according to the numbers, it is. This shows that an alternate solution that will be able to get CPR to a victim quicker will increase the chances someone survives a cardiac arrest.
The Product

The envisioned system would be a software-based application that would be run on either a user’s cellphone or as a webpage. There will be two user interfaces depending on if the user is a victim or a responder. The user interface for the user will be simple enough such that anyone who has access to a smartphone or quick access to the web will be able to use this application. It will probably be a simple button and all the important information will be collected internally. The application will access GPS satellites or use Wi-Fi positioning to determine the victim’s position and then will send to a server data with the victim’s position. The server will then access the database which has a list of all the geolocations of CPR certified clients and then the server will calculate and find the 5 closest CPR certified users. Then the server will send a push notification to these users so they get a message that says someone in their area is in trouble with that victim’s GPS location. Then the users will confirm receiving the message and being on the way. The application will automatically take their location and calculate the quickest route between them and the victim and then open the second user interface for the CPR users that displays the calculated route on a map.

Partnerships and Distribution

To effectively distribute this application it is important to partner with various organizations. Locally there are various EMS, such as at Stony Brook University there is a student run volunteer EMS. In addition, there are global companies that would probably collaborate to help distribute this application such as American Heart Association and the American Red Cross. The American Red Cross is the predominant organization that offers CPR training in America and by partnering with them they can distribute or promote the application at CPR sessions guaranteeing people who are CPR certified know about the application. And the American Heart Association is also a big proponent of promoting the use of CPR. They could provide support through awareness and funding.

Milestones and Constraints

One of the biggest constraints of this application is that it only works when it is ubiquitous. Thus, the first milestone would be to get a large percentage of controlled area to use the system. This percentage would be calculated such that each person who is using the application would have at least 1 person closer than 8 minutes away from them.

Another constraint of this application is that we would need access to a lot of data storage to keep tracking of everyone’s location. Thus, the second milestone would be having a significant amount of servers available to handle a significant amount of people.

The third constraint would probably be privacy of all this data. Not only would there be a need for a lot of data it would need to be secure and legal privacy notices would have to be issued to users of the application.
Scenarios

An example of a successful use of the application would be as follows: Michael and Aaron are walking around Coram, NY when Aaron collapses from cardiac arrest. Michael pulls out his cellphone and calls 911 to alert them. The nearest ambulance is 9 minutes away. Michael is no longer CPR certified and he looks around and cannot find anyone in sight who he can ask for help. Normally, he would just have to wait for the ambulance to arrive and risk Aaron life. However, he remembered the application he had downloaded during CPR training that alerts nearby CPR responders. He uses the application and Josh who lives in a building 2 minutes away gets the message and Michael’s location. He then runs over within 2 minutes and shows Michael that he is CPR certified and performs CPR on Aaron. Then an EMT arrives to continue perform CPR and take Aaron to the hospital; Aaron survives this incident and lives to continue studying computer science. Had CPR not been performed so early the EMT would not have performed CPR because Aaron would have to be pronounced dead by that point.
Works Cited