PLASMA DONOR APPLICATION

TEAM LEADER : ASHWIN RUPAK S A B
TEAM MEMBER 1: HARISSH S
TEAM MEMBER 2: JANARTHANAN J
TEAM MEMBER 3: KISHORE KUMAR N

LITERATURE SURVEY

1. NEAREST BLOOD & PLASMA DONOR FINDING: A MACHINE LEARNING APPROACH

The necessity of blood has become a significant concern in the present context all over the world. Due to a shortage of blood, people couldn't save themselves or their friends and family members. A bag of blood can save a precious life. Statistics show that a tremendous amount of blood is needed yearly because of major operations, road accidents, blood disorders, including Anemia, Hemophilia, and acute viral infections like Dengue, etc. Approximately 85 million people require single or multiple blood transfusions for treatment. Voluntary blood donors per 1,000 population of some countries are quite promising, such as Switzerland (113/1,000), Japan (70/1,000), while others have an unsatisfying result like India has 4/1,000, and Bangladesh has 5/1000. Recently a life-threatening virus, COVID-19, spreading throughout the globe, which is more vulnerable for older people and those with pre-existing medical conditions. For them, plasma is needed to recover their illness. Our Purpose is to build a platform with clustering algorithms which will jointly help to provide the quickest solution to find blood or plasma donor. Closest blood or plasma donors of the same group in a particular area can be explored within less time and more efficiently.

2. PASSIVE BLOOD PLASMA SEPARATION AT THE MICROSCALE; A REVIEW OF DESIGN PRINCIPLES AND MICRODEVICES

Blood plasma separation is vital in the field of diagnostics and health care. Due to the inherent advantages obtained in the transition to microscale, the recent trend in these fields is a rapid shift towards the miniaturization of complex macro processes. Plasma separation in microdevices is one such process which has received extensive attention from researchers globally.

Blood plasma separation techniques based on microfluidic platforms can be broadly classified into two categories. While active techniques utilize external force fields for separation, the passive techniques are dependent on biophysical effects, cell behavior, hydrodynamic forces and channel geometry for blood plasma separation. In general, passive separation methods are favored in comparison to active methods because they tend to avoid design complexities and are relatively easy to integrate with biosensors; additionally they are cost effective. Here we review passive separation techniques demonstrating separation and blood behavior at microscale.

We present an extensive review of relevant biophysical laws, along with experimental details of various passive separation techniques and devices exploiting these physical effects. The relative performances, and the advantages and disadvantages of microdevices discussed in the literature, are compared and future challenges are brought about.

3. BLOOD DONATION APPLICATION WITH IMPLEMENTATION OF MACHINE LEARNING

Blood is one of the most important elements of human body. Blood can be defined as the fluid we have in our bodies that carries oxygen from the lungs to the rest of the body. It also carries waste to be eliminated from the body. We have between 4 and 6 liters of blood in our adult bodies depending on size. Millions of people need blood every year.

There are tens of thousands of pints of blood that are needed every day to help people. Due to deficiency of blood a person can suffer from serious health issue and may even die. Medical science cannot produce blood but with the blessing of medical science blood can be transferred from one person to another. A lot of people's live can be saved if blood donors are easily available. The blood donation Application we are making puts the power to save lives in the palm of your hand. Donating blood and blood components are easier than ever.

A person just needs to have an account in our Blood Donation Application, then he can both donate and request for blood anytime. "BLOOD DONOR" is a free blood Donation app available for Android Smartphone. Blood Donor searches, notifies and connect thousands of blood donors in some simple steps. Blood Donor donation app ensures hassle free blood donation and privacy of a blood donor. Connecting blood donors and needy reduces time which increases the possibility of saving lives and also eliminates the shortage of blood. Blood donation exclusive app "BLOOD DONOR" is a free location based blood donation app.

It is one of its first and only unique applications available with feature of real-time map and machine learning algorithm for finding the best suitable donor. It uses the phone's internet connection to let us search blood donors and recipient. This Android based mobile application finds the blood donor by GPS location service. The App is also able to find the best matches among the donors available with the help of machine learning algorithms. The algorithms are capable of analyzing the profile of each donor and find the best fit ones with respect to health condition and lifestyle. Moreover, the app is also capable of showing the exact position of the donors in the map who are willing to donate blood. The Blood Donation App will make the easiest and fastest way to get a best match blood donor.

4. WAYS TO KEEP YOUR PLASMA HEALTHY

Convalescent Plasma (CP) therapy is an efficient method in the treatment of COVID-19 patients who either have a weak immune system or who are early in their illness. The notable setback for the implementation of the CP therapy lies in understanding the availability and spatial distribution of plasma donors. A multi-agent-based expert system is proposed in this paper to identify a suitable plasma donor in a short span and also in an efficient manner. Moreover, the issues with blood banks are twofold in connection with uneven intra-state and interstate distribution and lacuna of necessary facilities like the Component Blood Separation Units (CBSU) and Apheresis. The proposed expert system would remove the barriers of non-uniform distribution of blood banks and facilities across the country, and will provide a suitable solution to overcome the pandemic using multi-agent systems if implemented systematically.

5. BLOOD DONATION AND LIFE SAVER-BLOOD DONATION APP

“Blood” one of the most important necessity of our life. The numbers of blood donor is very less when compared with other countries. In our project we propose a new and efficient way to overcome such outline. Such as just touch the button donor will be ask to enter an individual's details like name, phone number, age, weight, date of birth, blood group, address etc.

At the emergency time of blood needed we can check for blood donor nearby by using GPS. Once the app user enter the blood group which he/she needed it will automatically show the donor nearby and send an alert message to the donor. In case if the first donor is not available it will automatically search the next donor which is present in queue.

If the donor accept the request then an one time password (OTP) will be send to the donor to verify. Blood donation app provider list of donor in your city/area. Once the donor donate the blood it will automatically remove the donor detail for next three months.

6. INSTANT PLASMA DONOR RECIPIENT CONNECTOR ANDROID APP

Although the government is carrying out Covid vaccination campaigns on a large scale, the number of vaccines produced is not enough for all the population to get vaccinated at present. And with the corona positive cases rising every day, saving lives has become the prime matter of concern.

As per the data provided by WHO more than 3 million people have died due to the coronavirus (https://covid19.who.int/). However, apart from vaccination, there is another scientific method by which a covid infected person can be treated and the death risk can be reduced. This plasma therapy is an experimental approach to treat corona-positive patients and help them recover. This plasma therapy is considered to be safe & promising. A person who has recovered from Covid can donate his/her plasma to a person who is infected with the coronavirus. This system proposed here aims at connecting the donors & the patients by an online application. By using this application, the users can either raise a request for plasma donation or requirement.

This system is used if anyone needs a Plasma Donor. This system comprises of Admin and User where both can request for a Plasma. In this system there is something called an active user, which means the user is an Active member of the App and has recovered from Covid 19, only such people are recommended here for Plasma Donation. Both parties can Accept or Reject the request. User has to Upload a Covid Negative report to be able to Donate Plasma.

7. SYNTHETIC PAPER SEPARATES PLASMA FROM WHOLE BLOOD WITH LOW PROTEIN LOSS

The separation of plasma from whole blood is the first step in many diagnostic tests. Point-of-care tests often rely on integrated plasma filters, but protein retention in such filters limits their performance. Here, we investigate plasma separation on interlocked micropillar scaffolds (“synthetic paper”) by the local agglutination of blood cells coupled with the capillary separation of the plasma.

We separated clinically relevant volumes of plasma with high efficiency in a separation time on par with that of state of the art techniques. We investigated different covalent and noncovalent surface treatments (PEGMA, HEMA, BSA, O2 plasma) on our blood filter and their effect on protein recovery and identified O2 plasma treatment and 7.9 μg/cm2 agglutination antibody as most suitable treatments.

Using these treatments, we recovered at least 82% of the blood plasma proteins, more than with state-of-the-art filters. The simplicity of our device and the performance of our approach could enable better point-of-care tests.

8. B-DONOR: A GEO-LOCALISED BLOOD DONOR MANAGEMENT SYSTEM USING MOBILE CROWDSOURCING

Blood donation is a noble act but during emergency times people rarely find blood donors. In this paper, we present an architecture for and prototype of a blood donation system using crowdsourcing for smartphones whereby anyone at the nearest location can search for their desired blood group. We discuss our system features and functionalities.

We developed our system with the idea of mobile crowdsourcing. This system will help the blood requester to find the donors of requested blood groups in the nearby location. Location information will send to the system by using GPS in our proposed system.

Requesters can search donors from their current or destination location. As we proposed to find more than one donor parallelly and request for more than one blood group, our system will save time and protect from any disappointed. This system search donor within 5km, as a result, finding donors and arriving at the destination will be easier and in the most short time period. In the future, we will implement the user information in the block chain.

9. The role of identity in how whole-blood donors reflect on and construct their future as a plasma donor

In the context of decreased demand for whole blood and increased demand for plasma-derived products, donors in Australia are increasingly being asked to convert from whole-blood to plasmapheresis donations. Plasmapheresis is a different type of donation to whole blood as the process takes longer and can be engaged in more frequently. What is unknown is whether whole-blood donors view donating plasma as consistent with their donor identity and how they respond to the possibility of donating more frequently.

To explore this, we undertook semistructured telephone interviews with 26 whole-blood donors who had recently made their first plasma donation. Findings indicated that whereas donating plasma was viewed as a bigger ask than donating whole blood, the former was viewed as consistent with their identity as a donor because both behaviours were seen to benefit others and self and were located within the same institutional context.

Donating plasma was an opportunity for donors to enhance their self-concept as an altruistic giver. When contemplating their future donation behaviour, donors considered how their donor identity would fit alongside other salient roles. These findings have implications for how institutions can position their request of existing donors to give a different gift.

10. Help Is in Your Blood—Incentive to "Double Altruism" Resolves the Plasma Donation Paradox

Blood donation is considered as one of the purest forms of altruism. Plasma donation, in contrast, despite being a similar process, is mostly a paid activity in which donors are compensated for their contribution to the production of therapeutic preparations. This creates a so-called "plasma paradox:" If remuneration is promised for a socially useful effort, volunteers with altruistic motives might be deterred. At the same time, regular plasma donors who pursue the monetary benefits of donation might drop out if remuneration stops.

The same controversy can be caught in the messages of most plasma donation companies as well: They promise a monetary reward (MR), and at the same time, highlight the altruistic component of donation. In this study, we tested the assumption that emphasizing the social significance enhances the willingness to donate blood plasma more effectively than either MR or the combination of these two incentives.

This had to be rejected since there was no significant difference between the three scenarios. Furthermore, we also hypothesized that individuals might be more motivated to donate plasma if there is a possibility of offering an MR toward other socially beneficial aims. We found an increased willingness to donate in scenarios enabling "double altruism", that is, when donating plasma for therapeutic use and transferring their remuneration to nongovernmental organizations, is an option.

We propose relying on double altruism to resolve the plasma paradox, and suggest that it could serve as a starting point for the development of more optimized means for donor recruitment.