



Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and submitted on 31st January and 1st February 2019 as per the schedule)

The purpose of this form is to allow final year students of the B.Sc. (Hon) degree program to enlist in the final year project group. Enlisting in a project entails specifying the project title and the details of four members in the group, the internal supervisor (compulsory), external supervisor (may be from the industry) and indicating a brief description of the project. The description of the project entered on this form will not be considered as the formal project proposal. It should however indicate the scope of the project and provide the main potential outcome.

PROJECT TITLE	IoT device to detect Anemia	
RESEARCH DOMAIN	Health and Informatics	
PROJECT NUMBER	79	(will be assigned by the lecture in charge)

PROJECT GROUP MEMBER DETAILS: (Please start with group leader's details)

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	M.H.M.Akmal (GROUP LEADER)	IT16134072	+9475-0788091	akmalhhafeel.bc@gmail.com
2	M.Pravienth	IT16048324	+94756746771	mahespravienth123@gmail.com
3	N.Kayanthan	IT16123014	+94778438349	kayankayanthan@gmail.com
4	H.S.M.H. Fernando	IT16136120	+94770724301	mfernando3917@gmail.com

SUPERVISOR

Miss. Shahika lokuliyana

Name

Signature

Date

CO-SUPERVISOR (will be assigned by the Supervisor, if necessary)

Mr. Anuradha Jayakody

Name

Signature

Date

EXTERNAL SUPERVISOR (if any, may be from the industry)

Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem:

Anemia is a major disease that is faced in Sri Lanka. Although the effect of anemia is not as popular as dengue the effects of Anemia has caused plenty of problems. Which initially starts with fatigue and then goes on to heartbeat reduction as well as the amount of oxygen that is supplied to the organs are reduced the potential of organ failure is a highly possible effect that is caused by anemia.

Anemia a disease that is experienced by a condition in the blood where there are low iron levels in the blood. This is mainly caused due to the lack of hemoglobin. As hemoglobin plays a vital role in the blood which is to carry oxygen and energize cells. When the blood lacks hemoglobin the bright red color of the blood decreases, because it is the main pigment in blood which makes the blood red color. There are more than 400 types of Anemia and the causative factors can be divided into three sections as;

1. Anemia caused due to blood loss
2. Anemia caused due to faulty or decreased red blood cells production
3. Anemia caused by destruction of red blood cells

According to statistics obtained from the WHO, globally, anemia affects 1.62 billion people (95% CI: 1.50–1.74 billion), which corresponds to 24.8% of the population (95% CI: 22.9–26.7%). This is a large amount of anemia patients that has been recorded. The highest amount is seen in children, mainly in pre-school children.

Description of the Solution:

The solution proposed is that to detect the disease at an early stage and give the necessary treatments. This research is mainly based on identifying the disease. Because early detection leads to early cure this would help to identify the whether a patient is suffering from anemia for this we are coming up with a device. The device would mainly be functioning as given in the below diagram.

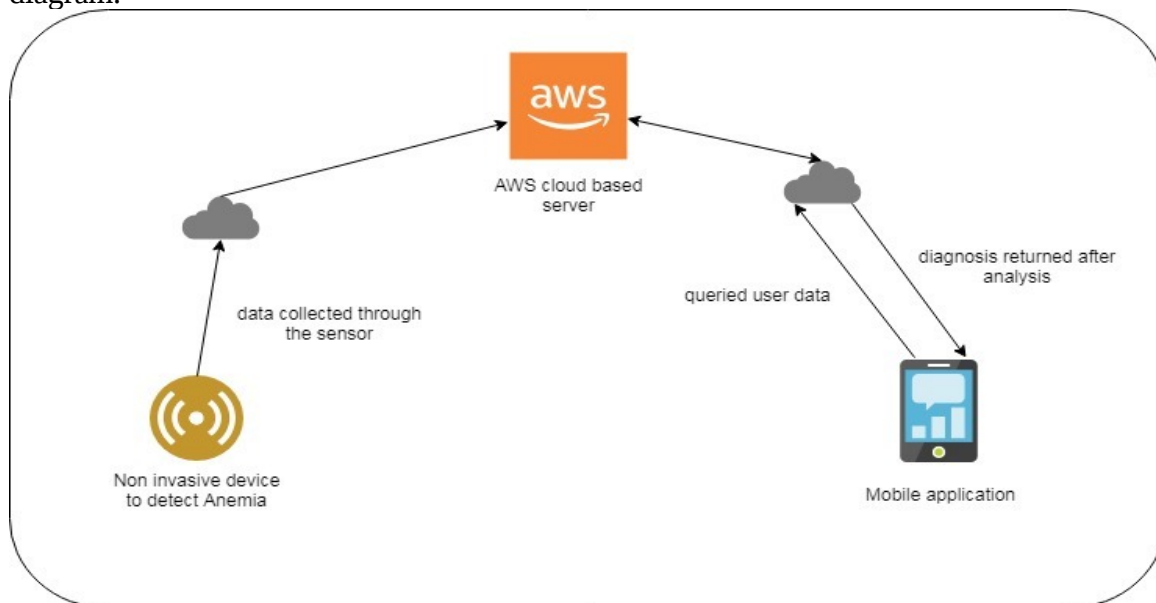


Figure 1

So, based on the figure 1 we shall be designing a device where the input can be detected. The input would be taken by sensing the amount of blood content that is available in the fingertip. This would be done using image processing. Taking this input is vitally important for the processing. Then next inputs would be taken from the questionnaire that is designed in the app. Where the questions would be designed based on the certain symptoms and behavioral changes that happen to a patient that as been infected with anemia. These inputs would then be communicated to the server. We would be using the AWS server to configure the communication between the hardware and the software components. In the server we shall be having an algorithm that runs to determine whether the patient is diagnosed with anemia or not. Then the results would be sent back to the app where the user would be able to view the results. Therefore, for this solution we will be using a non-invasive method, where we would not be taking any blood to detect the disease.

Main expected outcomes of the project:

A device to detect anemia at an early stage, an app to get user data and to gain an in-depth knowledge in the following fields;

IoT

Image processing

Machine learning

WORKLOAD ALLOCATION (Please provide a brief description about the workload allocation)

MEMBER 1	- Logically analyze the hardware component and check for inputs - Image processing configuration - Server configuration - Research Area – Image processing and detection of difference
MEMBER 2	- Build Android app - Create a questionnaire with related questions to anemia and make questions related to the behavioral changes are also included in the questionnaire - Research Area – Developing an app using android studio or another platform. Sending and receiving data and designing the questionnaire
MEMBER 3	- Setting up the hardware components - Identifying the physical symptoms and difference between an anemia diagnosed person's fingertip blood concentration compared to a normal person. - Research Area – Using of raspberry pi and programming the raspberry pie to input data from camera.
MEMBER 4	- Main algorithm is run in the server - Depending on the inputs from both devices deciding whether the patient is diagnosed with anemia or not. - Research Area- developing an algorithm with machine learning by getting the inputs whether the patient is affected or not.

DECLARATION

"We declare that the project would involve material prepared by the Group members and that it would not fully or partially incorporate any material prepared by other persons for a fee or free of charge or that it would include material previously submitted by a candidate for a Degree or Diploma in any other University or Institute of Higher Learning and that, to the best of our knowledge and belief, it would not incorporate any material previously published or written by another person in relation to another project except with prior written approval from the supervisor and/or the coordinator of such project and that such unauthorized reproductions will construe offences punishable under the SLIIT Regulations.

We are aware, that if we are found guilty for the above-mentioned offences or any project related plagiarism, the SLIIT has right to suspend the project at any time and or to suspend us from the examination and or from the Institution for minimum period of one year".

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