



## Sri Lanka Institute of Information Technology

### PROJECT REGISTRATION FORM

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      Elderly Patient Monitoring System

RESEARCH GROUP      Machine Learning

PROJECT NUMBER     

#### PROJECT GROUP MEMBER DETAILS:

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Abeyrathne H.V.L.K.	IT14073656	0754751694	vishvaabeyrathne@gmail.com
2	Sudhasinghe S.P.L.P.	IT14054532	0711490566	lankanath1993@gmail.com
3	Chathurangi W.A.S.	IT14069482	0777752906	sajinichathurangi1994@gmail.com
4	Ranathunga R.M.K.V.	IT14044632	0719537075	kaushalya.virajani@gmail.com

**SUPERVISOR**

Mr. Yashas Mallawarachchi		05/03/2017
Name	Signature	Date

**CO-SUPERVISOR**

Name	Signature	Date

**EXTERNAL SUPERVISOR**

Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

**ACCEPTANCE BY CDAP MEMBER**

Dr. Jeewani Bamunusinghe		07/03/2017
Name	Signature	Date

## PROJECT DETAILS

### Brief Description of your Research Problem:

Majority of the elderly bedridden patients are getting treatments under their own roof and require special caring with continuous human monitoring. Problem with the human monitoring is that it requires well trained caregiver with sound knowledge and skills to keep eye on the patient all the time. Finding well qualified caregivers/private nurses is not an easy task while they are limited and already assigned for particular jobs. It requires high concentration level even for well trained and qualified caregivers to monitor the patient in every single second. There are several computerized monitoring systems available to date, but which are lack of many mandatory features worth to their extreme cost. Therefore an inexpensive system which can monitor multiple necessary facts about the patient's health would be ideal. Luxury of an automated patient monitoring system is that even a family member can become a caregiver to look after the patient since all the monitoring tasks is done through the system. With the industrialization and the globalization, most of the people are affected by respiratory problems and the majority of them are elderly people. Since deploying a system for all kinds of bedridden patient is not practical, system which is going to propose will be aimed for bedridden patients with respiratory problems.

**Description of the Solution:**

Computer vision and IOT based approaches are proposed for Sensor configuration, detecting anomalies of sensor inputs, detecting abnormality in emotions and the behaviors, anomaly detection through audio inputs and finally alert the responsible person with an appropriate alerting system. A drug reminder is also a part of the system where it can notify the caregiver to give the right dose of drug at the right time for the patient. The system has the capability to monitor patient's heart rate, the oxygen percentage in blood (SpO2) with the identification of the anomalies regarding those physical parameters. The particular sensors will be used to monitor heart rate and SpO2. The sensors will be connected to a personal computer through a wireless channel to detect anomalies. The identification of the emotions and the gestures of a bedridden patient is a must whereas he/she may not have the ability to convey their feelings in more appropriate manner while absence of the caregiver. Therefore figuring out the abnormalities in the emotions of the patient let the system to alert the caregiver when in need. The bedridden patients are naturally obstinate in behavior and the fact may negatively impact to their health condition due to various kinds of accidents. Therefore behaviors of the bedridden patients always should get to the consideration by the person who is taking the care of the patient. Due to these advantages of monitoring the behavioral patterns of the patient, the proposed system includes a feature for identifying the normal and abnormal behaviors to indicate an occurrence of an anomaly. Sleeping sessions, sudden wakeups and falling down will get in to major consideration. The identification of the noises coming from the patient or the surrounding objects might be important, when it comes to bedridden patients. Anomaly detection through audio inputs will be focusing on identifying the anomalies in the noises which will made by the both patient and the surroundings. Person who is taking care of a bedridden person has a high responsibility on his/her shoulders where sometimes he/she may forget to give the drugs of the patient in time with the right amount of dose. Proposed solution will send a reminder to the responsible person's mobile phone in the right time to give the right drug with the right dose. Person who is taking care of the patient will be notified whenever an anomaly is detected by the system.

**Main expected outcomes of the project:**

Early warning indicators will have a huge impact on informing care giver to be better equipped to make better care decisions and eventually will reduce the number of adverse events to improve patient outcomes .Money and space can be saved at clinics and hospitals With 24 hour monitoring of the patient and superior care given by the caregiver. Doctors can discharge the patients with safe health care conditions knowing that automated system is there for further monitoring at the domestic level. Healthcare cost will be less expensive comparing with the bedside devices used nowadays in the hospitals. People who are having bedridden patients in their home will be directly benefited with the proposed system. Elder's homes and Elder care agencies will be assisted by the suggested patient monitoring system. System will eventually eases up the duties of the family caregiver where he/she can manage the day to day work as while taking care of the patient and can save the amount of cost which is needed for a separate caregiver or a nurse.

**WORKLOAD ALLOCATION****MEMBER 1**

Setting up suitable sensors according to the physical parameter such as heart rate and spo2 is required. Captured incoming inputs should be sent to the computer. Analysis of the heart rate is necessary to monitor the arrhythmia. Further analysis on differentiation of the SpO2 is required. Finally anomalies in the heart rate and the SpO2 should be detected according to the analysis using a signal processing technique.

## MEMBER 2

Features in emotions of the patients should be identified for further extraction. Extracted features should be classified in order to detect anomalies. Finally the responsible person should be notified in case of an abnormality in emotions.

## MEMBER 3

Data of both the normal and abnormal behaviors of patients should be collected. Categorize the set of behaviors based on the state of the patient in order to create different profiles for patients in different health conditions. Construct a classification model for detecting the behavioral abnormalities.

## MEMBER 4

Features will be extracted for classification in order to identify normal sound levels of the patient and the background. Sound levels beyond the normal level should be recognized as abnormal using an audio signal processing technique. Train the module by providing data related to drugs of the patient and notify the responsible person regarding drug taking.

**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".

	STUDENT NAME	STUDENT NO.	SIGNATURE
1	Abeyrathne H.V.L.K.	IT14073656	
2	Sudhasinghe S.P.L.P.	IT14054532	
3	Chathurangi W.A.S.	IT14069482	
4	Ranathunga R.M.K.V.	IT14044632	