



Sri Lanka Institute of Information Technology

PROJECT REGISTRATION FORM

(This form should be completed and uploaded to the Cloud space on or before XXXXXXXXX)

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

(As per the accepted
topic assessment form)

Early Warning for Pre And Post Flood Risk Management

RESEARCH GROUP

(as per the Topic
assessment Form)

Artificial Intelligence and Machine Learning

PROJECT NUMBER

(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
Format	Perera C.D.D	ITxxxxxxx	0712345678	itxxxxxxx@my.sliit.lk
1	Ilukkumbure S. P. M. K. W.	IT18022902	0772524013	it18022902@my.sliit.lk
2	Mohamed M. F.	IT18003406	0763457419	it18003406@my.sliit.lk
3	Samarasiri V. Y.	IT18012620	0767849160	it18012620@my.sliit.lk
4	Vinobaji S.	IT17181648	0761907209	it17181648@my.sliit.lk

SUPERVISOR, CO_SUPERVISOR Details

SUPERVISOR Name	CO-SUPERVISOR Name
Mr. Samantha Rajapakshe	Ms.Dilani Kaveendri
Signature	Signature
Attach the email as Appendix 1	Attach the email as Appendix 2
16/03/2021	16/03/2021
Date	Date

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

				Attach the email as Appendix 3
Name	Affiliation	Contact Address	Contact Numbers	Signature/Date

ACCEPTANCE BY CDAP MEMBER (This part will be filled by the RP team)

Name	Signature	Date

PROJECT DETAILS

Brief Description of your Research Problem: (extract from the topic assessment form)

Flood early warning for any place, at a time, is an extreme challenge due to uncertain estimates of the natural factors such as rainfall, the drainable volume of water at a certain time, the absorbable volume of water by soil, and sea levels of land, and artificial factors such as constructions and not properly maintain of drainage. Which will result in fast floods.

Making a correlation between natural and artificial factors that cause flooding under consideration historical data of rainfalls and floods and make early flood warning after consideration of real-time data (IoT weather sensors, real-time weather APIs).

During this scope of project following research areas required to be carried out.

- Research on modern weather prediction techniques, factors that affecting the severe weather conditions which may cause flooding.
- Research on IOT devices and analyze the capabilities to finalize list of IOT devices for the scope of this project and data representation based on it.
- Research on live-data-feeds of Weather information APIs and identify most relevant data-feeds which are accurate and real-time basis. Also, the data-feeds properties which required for the proposed solution need to be finalized during this research.
- Analyze Data Mining algorithms and identify the most relevant and suitable algorithm for the weather prediction based on the historical datasets.

Description of the Solution: (extract from the topic assessment form)

In order to address the problems described in “Abstract” section by addressing above specified “Research Problems”, we will be providing a comprehensive solution by adhering to the latest design patterns and techniques. The proposed solution will meet our primary objective of providing early warning system in adverse weather conditions which may cause flooding. Our proposed solution will present more advanced and most relevant data to the public crowd in near real-time basis also in understandable and simplified manner.

Our proposed solution contains following components in high-level:

- Using historic data analysis build a prediction model which will be able predict the flooding occurrences. Data-Mining techniques and algorithms will be utilized for the predictions. The historic raw data relevant to flooding will be collected from “Department of Meteorology”. Data analyzation and categorization will be carried as research to select with most relevant Data Mining Algorithm.
Therefore, it is required to develop a component which provides whether prediction based on the historic data.
- Based on the outcome of the research on real-time weather data feeds, our proposed solution will utilize most accurate and near real-time based API and represent data to crowd in simplified manner.
Our solution should implement a component to integrate with these APIs and consume data in real-time manner.

- Based on the outcome of the research on IoT devices, the selected IoT devices will be utilized to get the real time/non real time data. How the proposed solution integrate with the IoT devices will be decided based on the research come.
- In order to gather the data inputs from public crowd on the current weather, we will be developing a component which will act as a crowd sourcing solution.

As a post solution of the system, we will be providing an early warning alert to all the users. Usually, our end users are public crowd, state officials, non-state officials. All the above-mentioned solution components are integrated within our proposed solution and data will be represent to the end-users in most relevant and simplified manner.

Main expected outcomes of the project: (extract from the topic assessment form)

Main Objective: Our primary objective is to provide an early warning mechanism to predict severe weather conditions which may cause flooding and provide warnings of landslides to the end users (Residents, Sightseers).

WORKLOAD ALLOCATION (extract from the topic assessment form after correcting the suggestions given by the topic assessment panel.)

(Please provide a brief description about the workload allocation)

MEMBER 1	S. P. M. K. W. Ilukkumbure - IT18022902
<ul style="list-style-type: none"> • Collect the data from the 3rd party APIs providers to feed data into the model. In this section we will be gathering data from various trusted 3rd party APIs to have an accurate and verified data output to users as in in this platform accurate data output is really needed and required as in many parties will be depending on these data because this platform will lead to many precautions and steps taken to mitigate the catastrophe. • Design a data driven model to predict the flooding situation from historic and real time data sources. With the Data mining of historic data building an improved model of Rainfall prediction using ANN (Artificial Neural Network). Use of real time data sources, evaluating outcome of prediction algorithm and confirm the predicted values to build Classification model of Rainfall predictions. • Design a decision-making model to decide a situation from the crowdsourcing information. Build a regression analysis model from outputs of the prediction Algorithm will navigate to the predicted data towards the decision-making model so that the relevant information will be compared with crowdsource information. 	

MEMBER 2 M. F. Mohamed - IT18003406

- Design an IoT device to measure the water level and the GPS location of the IoT device.
Since our main target on predicting and calculating the flood level we will also be designing a IoT device to measure the water levels readings of flooding areas. With that device we will be giving a live output of flood levels which could be used by the public and state official authorities.
- Design a mode for IoT devices to transmit raw data to database.
All data gathered using the designed IoT devices by us will be passed to the web server and then will be compared with various other methods and sources used. All such collected data will be stored in our database for late user and referencing where we will be doing a data comparison prior passing on the final data to user preview.
- Conduct ethnographical study in selected areas of the countries within the stakeholders of this system to ensure that the historical data gathered is up to and recommended stranded which we could use to verify data.

MEMBER 3 Samarasiri V. Y. – IT18012620

- Design and visualize weather information on web portal.
Various types of data gathered from the use of IoT devices and predicted data information will be given to users via a Web Portal for a better and clear view of the required data. The output of the data given here to the users will be compared using predictive models and the most suitable and the accurate data will be transmitted to the users for their use.
- Design method to get information crowdsourcing information.
We will also be using an interesting method such as crowdsourcing to have better accurate data verification gathered from various methods so that the output data will be quality and assured data which will not mislead any stakeholder of this system. The gathered data from crowdsourcing will be passed on to the database after verification of the accuracy of the data and will be processed on the output.
- Design a IoT device to sensor the temperature.
We will not only be focusing on the flooding situation, but we will be providing data for all other basic weather factors which temperature is one of the main elements which will be considered. In this device we will be giving live temperature details to all the users and stored these data for later use and to complete the data prediction model also with the use of this data.

MEMBER 4	Vinobaji Selvaatnam – IT17181648
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- Design an IoT device to sensor and humidity.

Apart from the flooding prediction, we will also be giving data to users on the humidity which is one of the factors which will be considered in predicting the weather change. So together with other weather data factors will be providing necessary details to the user which will be useful for their day-to-day life.

- Design user-friendly mobile application

Make the most user-friendly mobile application for users where users can get weather results (humidity, rainfall, temperature, etc.). This app works as a platform for crowdsourcing. This mobile application will also be giving alerts to users. Here we add some features of government emergency hotline links that will be helpful for users to get help. Overall, mainly provide 2 types of weather data (online weather data, sensors data), prediction for flood threat areas, and flooded area base on crowdsourcing.

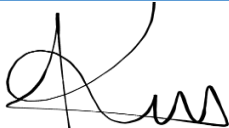


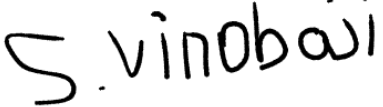
- Design a method to alert all the users to provide information in a specific area.

This is will also be one of the important aspects of our system as we will be providing warnings and alert notification of flooding and landslides to all our users which includes state officials and non-state officials for their personal and official work preparation.

DECLARATION (Students should add the Digital Signature)

"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
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4	Vinobaji S.	IT17181648	

APPENDIX 1

Supervisor- Mr. Samantha Rajapaksha

Re: 2021-Reg-Topic Assessment form of TMP-21-160 for Supervisor Mr. Samantha Rajapaksha Endorsement - Message (HTML)

File Message Help McAfee Anti-Spam Attachments Tell me what you want to do

Ignore Delete Archive Mark as Spam Mark as Not Spam Add Friend Reply Reply All Forward More Meeting Delivery Report... To Manager Team Email Done Reply & Delete Create New Move Rules Assign Mark Categorize Follow Up Translate Find Read Aloud Zoom Send to OneNote

Re: 2021-Reg-Topic Assessment form of TMP-21-160 for Supervisor Mr. Samantha Rajapaksha Endorsement

Samantha Rajapaksha <samantha.r@slit.lk>
To: Mohamed M.F. IT18003406

You forwarded this message on 1/23/2021 10:10 AM.

TopicAssesment_1_TMP-21-160.docx
335 KB

U. U. Samantha Rajapaksha
M.Sc. (SLIIT), B.Sc. (Engineering)
Senior Lecturer/Coordinator M.Sc. in IT
Sri Lanka Institute of Information Technology
Tel: 01175448021 Mob: 0714121097
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Sat 1/23/2021 10:04 AM

APPENDIX 2

Co-Supervisor- Ms. Dilani Kaveendri Hewage

