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), the 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)	The Future of Crime Prevention: Police Case Analysis using Machine Learning
RESEARCH AREA (As per the Topic Assessment Form)	ICT for Development
PROJECT NUMBER	TMP-23-224 (Will be assigned by the RP Team)

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

	STUDENT NAME	STUDENT NO.	CONTACT NO.	EMAIL ADDRESS
1	Dharsan.R	IT20003982	077 280 9924	it20003982@my.sliit.lk
2	Krishanthini.M	IT19980928	076 814 6441	it19980928@my.sliit.lk
3	Traveena.C	IT20001452	076 101 4464	it20001452@my.sliit.lk
4	Anubama.L	IT20068196	076 478 9712	It20068196@my.sliit.lk

SUPERVISOR, CO_ SUPERVISOR Details

SUPERVISOR Name	**CO-SUPERVISOR Name**
Ms. Hansika Mahaadikara	Ms. Sanjeevi Chandrasiri
hansika.m@sliit.lk	sanji.c@sliit.lk

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)
The increasing economic crisis in Sri Lanka has led to a drastic increase in criminal cases such as murder, assault, robbery, domestic violence drug trafficking, drug possession, drug manufacturing, rape, sexual assault, etc. However, most of these cases are still analyzed manually, leading to longer investigation times and potential inaccuracies. At times some of the cases are not even taken to the count from the police stations considering as minor and common cases. And also, as the cases are handwritten and classified using human at times the accuracy level can be also doubtful, and the time taken for investigation can be lengthy. Manual processes for data collection, recording, and analysis are subject to human error, which can lead to inaccuracies in the information used to make decisions and allocate resources. Moreover, there is no any automated police system to analyze the locations where the most accidents occur and to make future predictions based on this analysis and to identify connections between accident cases. And also, the large volume of data generated by criminal cases can be difficult to manage and analyze, particularly if it is not properly organized and stored in an accessible database. Furthermore, Police officers and detectives have many demands on their time, including responding to emergency calls, writing reports, and appearing in court. This can make it difficult for them to allocate sufficient time and attention to analyzing criminal cases. Furtherly, Police officers may unconsciously bring biases and discriminatory attitudes to their work, which can affect their ability to make impartial and fair judgments when analyzing criminal cases. References: 1. Crime prediction using machine learning algorithms" by M. O. Adewole, et al. (2017) 2. A machine learning approach to crime prediction and resource allocation" by B. Alper, et al. (2015) 3. Machine learning for crime pattern analysis and prediction" by J. Han, et al. (2010) 4. Data-driven crime prediction using machine learning" by M. A. Alazab, et al. (2015) 5. Predicting crime hotspots using machine learning algorithms" by J. R. González, et al. (2016) 6. Machine learning for crime analysis and prediction" by J. E. C. H. Correa, et al. (2017) 7. A machine learning approach to traffic accident prediction" by X. Zhang, et al. (2017) 8. Accident prediction using machine learning algorithms" by M. O. Adewole, et al. (2018) 9. Predicting road accidents using machine learning techniques" by J. González, et al. (2016) 10. Traffic accident prediction using machine learning methods" by J. Li, et al. (2015)

Main expected outcomes of the project: (extract from the topic assessment form)
Main Objective: The main objective of this “The Future of Crime Prevention: Police Case Analysis using Machine Learning” is to provide police investigators with a powerful tool to effectively analyze past criminal cases and make accurate predictions about future crimes. The system will use vast amounts of crime, accident, crimes against women and case file datasets to train machine learning algorithms. The resulting predictions will help police investigators make informed

decisions and allocate resources effectively to prevent crimes and protect the public. This system will provide a comprehensive and sophisticated solution to the challenges faced by police in reducing crime and ensuring public safety.

Sub Objective 1: Analyze, predict accident locations and finding connections and patterns between police accident cases

Sub Objective 2: Analyzing and grouping commonalities among criminal cases and predicting the future crimes in terms of the nature of the crime.

Sub Objective 3: Analyzing and classifying similar case documents and predict category

Sub Objective 4: Clustering crimes against women and crime forecasting prediction using machine learning to create an effective solution to reduce and prevent such crimes.

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

(Please provide a brief description of the workload allocation)

MEMBER 1	Dharsan.R IT20003982
This can be used by the police staff or an admin, and in my component, I will analyze the locations where most accidents occur, predicting future accident locations, time and identifying connections between accident police cases. To achieve this, I will be responsible for tasks such as data preprocessing, feature engineering, exploratory and clustering analysis, developing machine learning models, evaluating their performance, and visualizing outputs. The main objective of my research is to gain a deeper understanding of high-risk areas for accidents, inform future predictions on accident locations, and develop targeted safety measures in these areas. The system aims to explore connections between accident police cases and identify common patterns, similarities, causes, or contributing factors, thus helping to create effective accident prevention strategies and target areas where accidents are more likely to occur. The system's outputs will be displayed in graphical formats, providing users with easy-to-understand insights that can help identify high-risk areas, predict future accidents, and develop targeted safety measures. Overall, this component is a valuable tool for police staff and administrators, helping to reduce the number of accidents and improve road safety through the use of machine learning.	

MEMBER 2	Krishanthini.M IT19980928
As mostly the criminal case analysis in done manually in security agencies it is difficult to handle large amount of data and it is a time taking process. Therefore, through this component users can analyze various criminal cases to identify patterns, trends, similarities in terms of the nature of the crime. And the system will predict future crimes and the rate of crimes using the insights gained from the analysis of past criminal cases to forecast potential future criminal activities as the output. The output will be displayed in dashboards with interactive visualization such as word clouds, network graphs, etc. so that the security agencies can easily understand. This process will involve in data gathering, Preparing the data, choosing model, training model, evaluating the model to identify patterns and trends that may indicate the likelihood of a particular type of crime occurring in a specific location or time frame. Moreover, analyzing and grouping commonalities among criminal cases and predicting future crimes is an important area of research and practice that can help security agencies to enhance public safety and prevent criminal activity.	

MEMBER 3	Traveena.C IT20001452

This component can be used by investigation team in police department when they want to get details about the previous case files during investigation. And this component helps in classifying similar case documents using various machine learning techniques and group similar documents together based on their content and assigns each document to a particular topic and label the dataset to predict the category. And through this predictive model and analyzed data the investigators can make informed decisions and identify the crime patterns and more information related to crime. And this component involves processes such as cleaning, normalizing, and transforming the data into a suitable format for the classification algorithm and then the relevant features are extracted from the text data and used to train the classification model. And through this categorizing of similar case documents, the investigation team can easily identify similar patterns, trends and relationship that will be relevant for their investigation. Automated document classification can reduce the risk of human error, increasing the accuracy of the investigation.

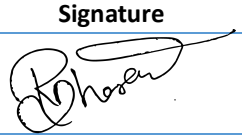
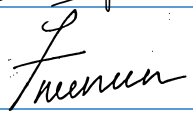
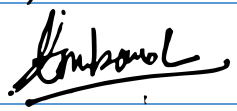
MEMBER 4	Anubama.L IT20068196

This component can be used by investigation team in police department when they want to get details about the crimes against women and crime forecasting prediction to create an effective solution to reduce and prevent such crimes during investigation. And this component helps in preprocessing crime data and clustering them using various machine learning techniques and group similar crimes against women based on their characteristics. And through this predictive model and analyzed data the investigators can make informed decisions and identify the crime patterns and more information, trends that may be relevant to the investigation. And this component involves processes such as collecting relevant data, performing clustering analysis, using machine learning algorithms for prediction, evaluating the model's accuracy, and continuously monitoring and updating the model. And through this clustering crimes against women and crime forecasting prediction modal the investigation team can easily get real-time warnings and recommendations to better understand the factors that contribute to crime and take proactive measures to prevent it also to improve the safety of women and This solution will be more time-efficient and accurate than relying solely on the human mind.

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**
1	Dharsan.R	IT20003982	
2	Krishanthini.M	IT19980928	
3	Traveena.C	IT20001452	
4	Anubama.L	IT20068196	

Appendix 1:

Supervisor details

	Title	First Name	Last Name	Signature
Supervisor	Lecturer	Hansika	Mahaadikara	09/02/2023
Co-Supervisor	Senior Lecturer	Sanjeewi	Chandrasiri	Sanjeewi 09/02/2023
External Supervisor				
Summary of external supervisor's (if any) experience and expertise				

Requesting supervisor for 4th year research project (RP - IT4010 - 2023)

43

Hansika Mahaadikara <hansika.m@sliit.lk>
To: Dharsan.R it20003982

Fri 12/16/2022 2:29 PM

[EXTERNAL EMAIL] ***This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.***

the first topic is better.
What s ur specialization?

There should be four separate research components.

SLIIT UNI
THE KNOWLEDGE UNIVERSITY
ICAC

Hansika Mahaadikara
MSc. (IT) , BSc. Hons (Spec. CSNE), MCSSL,CCNA
Lecturer
CSNE Degree Program - Year 3 & 4 coordinator

Department of Computer Systems Engineering,
Faculty of Computing,
SLIIT | Malabe Campus

011 754 3941
077 222 4848

Supervisor sent her contact number and we contact her. She accepted our topic through the phone call. For more proof herewith I have shared the screenshot of our discussions after we receiving the TAF results.

Requesting supervisor for 4th year research project (RP - IT4010 - 2023)

43

Hansika Mahaadikara <hansika.m@sliit.lk>
To: Dharsan.R it20003982
Fri 12/16/2022 2:44 PM

[EXTERNAL EMAIL] ***This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.***

pls call 0772224848

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Hansika Mahaadikara
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Lecturer
CSNE Degree Program - Year 3 & 4 coordinator

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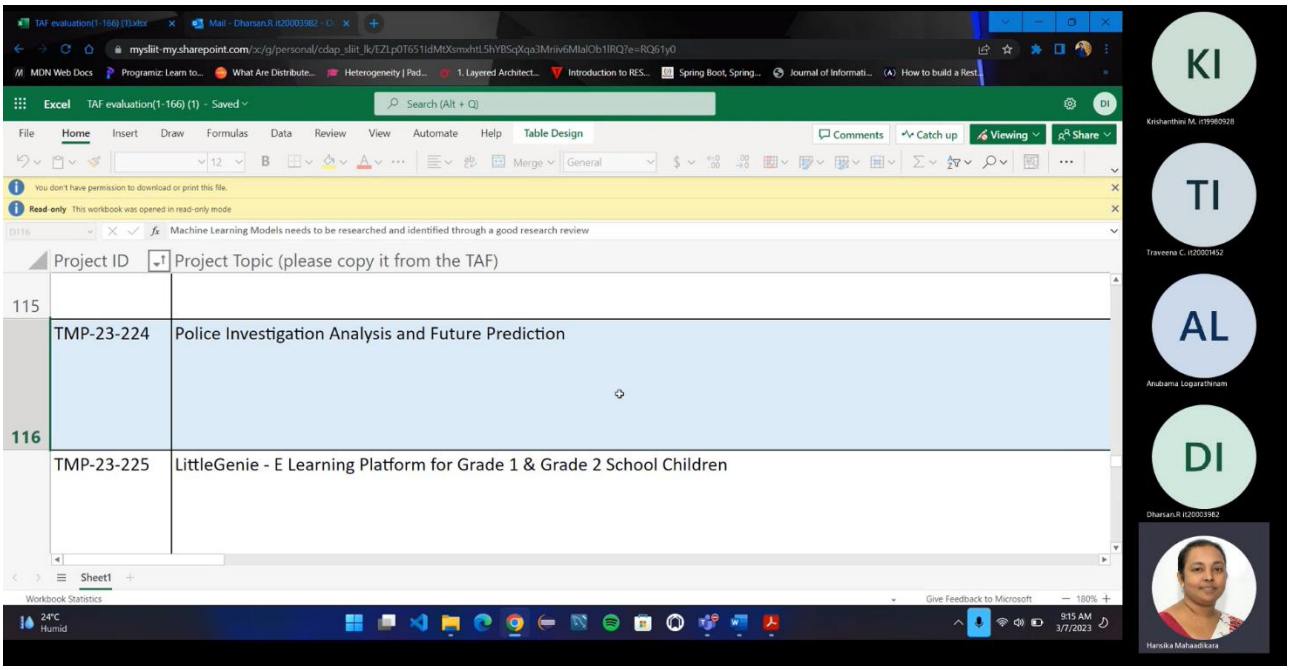

Appendix 2:

Co-Supervisor:

Requesting Co-supervisor for 4th year research project - 2023

DI

Dharsan.R it20003982
To: Sanji Chandrasiri
Fri 12/23/2022 10:53 AM

Research project - detective ...

Dear Madam,

Ms. Hansika Mahaadikara madam recommended you for co-supervisor and here we have attached the document including all the components.

We contacted our supervisor Ms. Hansika Mahaadikara madam and she gave us some ideas for the components, and we are looking forward to modifying our components as well. It would be a great support if you could be our co - supervisor on this project madam.

Looking forward for your reply.
For further clarification please contact us.

Group Members:
IT20003982 - Dharsan.R(Leader)
IT19980928 - Krishanthini.M
IT20001452 - Traveena.C
IT20068196 - Anubama.L

Requesting Co-supervisor for 4th year research project - 2023

Sanji Chandrasiri
To: Dharsan.R it20003982
Fri 12/23/2022 11:20 AM

[EXTERNAL EMAIL] ***This email has been received from an external source – please review before actioning, clicking on links, or opening attachments.***

OK please add me to the same whatApp group. 077-6918328.

However, I am not available till 28th December.

Sanjeevi Chandrasiri
M.Sc.(IT)(SLIIT), B.Sc.(Hons)(IT)(SLIIT), MIEEE, MBCS, MIET
Senior Lecturer - Department of Information Technology
Year 1 Course Leader
Faculty of Computing
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