SCHOOL OF COMPUTING
Faculty of Engineering

Project Proposal Form MCST1043
Sem: 2 Session: 2024/25

SECTION A: Project Information.

Program Name:	**Masters of Science (Data Science)**
Subject Name:	**Project 1 (MCST1043)**
Student Name:	MOHAMED AZLAN AMEER OLI
Metric Number:	MCS241050
Student Email & Phone:	azlan1996@graduate.utm.my
Project Title:	Deep Learning Approaches for Fraud Detection in Transactions for E-Commerce by using Convolutional Neural Network (CNN) & Recurrent Neural Network.
Supervisor 1:	
Supervisor 2 / Industry Advisor(if any):	

SECTION B: Project Proposal

Introduction:

As digital transactions in e-commerce platforms continue to grow, fraudulent activities have become a significant concern. Traditional fraud detection methods, such as rule-based systems and machine learning models, often fall short in identifying evolving fraud patterns. Deep Learning techniques offer a promising solution as they can capture complex patterns in transaction data. This research aims to investigate the potential of various Deep Learning models for detecting fraudulent E-commerce transactions, with a focus on improving detection accuracy, operational efficiency, and real-time performance.

Problem Background:

In the evolving landscape of digital commerce, detecting fraudulent transactions has become increasingly complex. Traditional fraud detection systems often struggle with limitations such as a high incidence of false alarms, limited adaptability to new fraud techniques, and difficulties

in scaling to meet the demands of real-time processing. These obstacles made effectiveness of fraud prevention strategies and can result in financial loss and customer dissatisfaction.

To solve these problems, Deep Learning method can be use. Models like Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs) have demonstrated strong capabilities in learning intricate patterns from large datasets. Their ability to automatically extract features and adapt to dynamic environments positions them as strong candidates for enhancing fraud detection mechanisms. This research explores the potential of these deep learning models to improve detection accuracy, minimize false positives, and support scalability in real-time fraud detection systems.

Problem Statement:

Current fraud detection systems face several challenges, including a high rate of false positives, difficulty in adapting to emerging fraud patterns, and scalability issues for real-time applications. Deep Learning models, such as Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs), are well-suited to address these issues. This research aims to assess the effectiveness of these models in reducing fraud-related losses while maintaining high scalability for real-time deployment.

Aim of the Project:

The aim is to improve fraud detection systems by lowering false positives, increasing adaptability to changing fraud patterns, and guaranteeing scalability for real-time transaction analysis in e-commerce environments, this project aims to assess the efficacy of deep learning models, specifically Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs).

Objectives of the Project:

The objectives of this research include:

1. **Development of Deep Learning Models:** To build and access deep learning models for fraud detection in e-commerce.
2. **Real-Time Fraud Detection:** To enhance real-time fraud detection capabilities while minimizing the rate of false positives.
3. **Model Explainability:** To explore the interpretability of models, thereby increasing trust in fraud detections systems.

Scopes of the Project:

1. Developing and training the Deep Learning Models for Classifications of Fraudulent in E-Commerce Transactions.
2. Comparing the performance of CNN and RNN in terms of accuracy, false positivity rate and their adaptability.
3. Exploring the interpretability of models and increasing trust in fraud detections system.

Expected Contribution of the Project:

This research aims to explore and compare deep learning models for detecting fraudulent transactions in e-commerce. By evaluating models like CNNs and RNNs, the study will identify the most effective approach for real-time fraud detection. The results will contribute to creating more secure and efficient fraud prevention systems in the E-commerce domain.

Project Requirements:

Software: Google Colab, Python

Hardware: Computer, 8gb Ram, GPU Nvdia

Technology/Technique/ Methodology/Algorithm: Research Framework, Kaggle Dataset.

Type of Project (Focusing on Data Science):

[/] Data Preparation and Modeling

[ ] Data Analysis and Visualization

[ ] Business Intelligence and Analytics

[/] Machine Learning and Prediction

[ ] Data Science Application in Business Domain

Status of Project:

[/] New

[ ] Continued

If continued, what is the previous title?

SECTION C: Declaration

I declare that this project is proposed by:

[/] Myself

[ ] Supervisor/Industry Advisor ( )

Student Name: Mohamed Azlan Ameer Oli

Signature **Date**

SECTION D: Supervisor Acknowledgement

The Supervisor(s) shall complete this section.

I/We agree to become the supervisor(s) for this student under aforesaid proposed title.

Name of Supervisor 1:

Signature **Date**

Name of Supervisor 2 (if any):

Signature **Date**

SECTION E: Evaluation Panel Approval

The Evaluator(s) shall complete this section.

Result:

[ ] FULL APPROVAL [ ] CONDITIONAL APPROVAL (Major)*

[ ] CONDITIONAL APPROVAL (Minor) [ ] FAIL*

***** Student has to submit new proposal form considering the evaluators' comments.

Comments:

Name of Evaluator 1: .....

Signature ..... **Date** .....

Name of Evaluator 2: .....

Signature ..... **Date** .....