

START HERE - Basic Information

This form must be completed for all student projects.

Before you proceed

Some activities inherently involve increased risks or approval by external regulatory bodies, so a proportional ethics review is not recommended and a full ethical review may be required.

These may include:

- i. Approval from an external regulatory body (including, but not limited to: NHS (HRA), HMPPS etc.);
- ii. Misleading participants;
- iii. Research without the participants' consent;
- iv. Clinical procedures with participants;
- v. The ingestion or administration of any substance to participants by any means of delivery;
- vi. The use of novel techniques, even where apparently non-invasive, whose safety may be open to question;
- vii. The use of ionising radiation or exposure to radioactive materials;
- viii. Engaging in, witnessing, or monitoring criminal activity;
- ix. Engaging with, or accessing terrorism related materials;
- x. A requirement for security clearance to access participants, data or materials;
- xi. Physical or psychological risk to the participants or researcher;
- xii. The project activity takes place in a country outside of the UK for which there is currently an active travel warning issued by the authorities (see info button);
- xiii. Animals, animal tissue, new or existing human tissue, or biological toxins and agents;
- xiv. The sharing of participant personal data with a third party, regardless of the form under which the data is presented.

If any of these activities are fundamental to your project, please contact your supervisor to determine if a full application is required.

This form must be completed for each research project which you undertake at the University. It must be approved by your supervisor (where relevant) PRIOR to the start of any data collection.

In completing this form, please consult the University's [Research Ethics and Governance standards](#).

A1a Please confirm that you will abide by the University's Research Ethics and Governance standards in relation to this project.

☒ Yes

☐ No

A1b The University is responsible for complying with the UK General Data Protection Regulation whenever personal data is processed. Under the Data Protection Policy, all staff and students have a responsibility to comply with the regulation in their day-to-day activities and when conducting research involving personal data. The first step you can take to understand these responsibilities is to review the [Data Protection in Research guidance pages](#) and complete the University's Mandatory Data Protection Training. Data protection training is available on the [intranet data protection pages](#), and student training available through the Academic Integrity section of the [Academic Skills module in Moodle](#) (and select 'Information Governance, click here to start'). To make sure your knowledge is up to date, all staff and students must complete the training every two years where they are using personal data. If you have any issues in accessing the data protection training or have any questions about the training, please contact dataprotection@mmu.ac.uk

Have you reviewed the Data Protection guidance pages and completed the Data Protection Training in the last two years?

- ☒ Yes
☐ No

A2 Are you submitting this application as a learning experience, for a unit which already has ethical approval? (please confirm with your supervisor)

- ☒ Yes
☐ No

A2.1 Approval reference (supplied by your supervisor)

A3 Student details

Title First Name Surname

<input type="text"/>	<input type="text" value="Jennifer"/>	<input type="text" value="Maliki"/>
----------------------	---------------------------------------	-------------------------------------

Email	<input type="text" value="JENNIFER.MALIKI@stu.mmu.ac.uk"/>
-------	--

A3.1 Manchester Metropolitan University ID number

A4 Supervisor

Title First Name Surname

Dr Raheem Sarwar

Faculty Business and Law

Telephone +44 (0) 161 247 6969

Email r.sarwar@mmu.ac.uk

A5 Which Faculty is responsible for the project?

Business and Law

A6 Course title

M.sc Business Analytics

A7 Project title

FRAUD DETECTION IN FINANCIAL TRANSACTIONS USING MACHINE LEARNING.

A8 What is the proposed start date of your project?

01/04/2025

A9 When do you expect to complete your project?

01/09/2025

A10 Please describe the overall aims of your project (3-4 sentences). Research questions should also be included here.

My research aims to thoroughly design and evaluate an adaptive, hybrid machine learning model for detecting fraudulent financial transactions which is needed to support financial institutions in protecting their systems and customers more efficiently. it will also access how various machine learning algorithms compare in terms of detection accuracy, computational efficiency, and suitability for real-time fraud detection and lastly, implementing scalable, adaptive machine learning systems in reducing false positives and improving early fraud detection

A11 Please describe the research activity

This research project focuses on the development and evaluation of machine learning techniques for detecting financial fraud. The primary aim is to evaluate the effectiveness of different machine learning models, including supervised learning, anomaly detection, and ensemble methods, in identifying both known and upcoming fraudulent transactions.

The study will follow a quantitative, secondary data-based design, meaning no human participants will be involved at any stage of the research. The research will begin with a detailed literature review of existing fraud detection strategies, model types, and evaluation methods. This will include academic journal articles, textbooks, conference papers, and industry reports accessed through online databases such as IEEE, ACM, and ScienceDirect.

The core of the project will involve working with two publicly available datasets:

- The IEEE-CIS Fraud Detection Dataset
- The European Credit Card Fraud Dataset

These datasets are anonymized and hosted on Kaggle. They contain no personally identifiable information, sensitive attributes, or private metadata. Because of this, no ethical risk to individuals is anticipated, and no participant recruitment, consent, or personal data handling is required.

Data analysis will involve the following steps:

- Data preprocessing, which includes feature selection, normalization, and addressing class imbalance using techniques such as SMOTE (Synthetic Minority Oversampling Technique).
- Model training and evaluation – testing a range of algorithms (e.g., decision trees, and neural networks) using Python-based tools like scikit-learn.
- Performance assessment – using metrics appropriate for imbalanced classification tasks, including precision, recall, F1 score, and AUC-ROC.

I won't be using primary data so there are no participants who can withdraw, and no consent forms or transcription steps are required. However, in line with good research practice, all data used will be stored securely on my Manchester Met OneDrive account, which will only be used for academic purposes and will not be shared or modified beyond what is needed for model training.

No animals or humans will be involved in the study, and the research will not pose any physical, psychological, or reputational risk to any party. The study is aligned with responsible data use principles and follows open science guidelines.

A12 Please provide details of the participants you intend to involve (please include information relating to the number involved and their demographics; the inclusion and exclusion criteria)

The datasets I intend to use are hosted on open data platforms and are explicitly intended for academic and research purposes. My study does not involve any human participants. All data used in the research will be sourced from publicly available, anonymized datasets. They do not contain personal identifiers, demographic details, or sensitive attributes related to real individuals.

And as such, there are no participants to be recruited, no inclusion or exclusion criteria, no demographic targeting, and no need for informed consent procedures

A13 Please upload your project protocol

Documents

Type	Document Name	File Name	Version Date	Version	Size
Project Protocol	RESEARCH PROTOCOL _ JENNIFER MALIKI	RESEARCH PROTOCOL _ JENNIFER MALIKI.pdf			194.5 KB

Project Activity

B1 Are there any Health and Safety risks to the researcher and/or participants?

- ☒ Yes
- ☐ No

B2 Please select any of the following which apply to your project

- ☐ Aspects involving human participants (including, but not limited to interviews, questionnaires, images, artefacts and social media data)
- ☐ Aspects that the researcher or participants could find embarrassing or emotionally upsetting
- ☐ Aspects that include culturally sensitive issues (e.g. age, gender, ethnicity etc.)
- ☐ Aspects involving vulnerable groups (e.g. prisoners, pregnant women, children, elderly or disabled people, people experiencing mental health problems, victims of crime etc.), but does not require special approval from external bodies (NHS, security clearance, etc.)
- ☐ Project activity which will take place in a country outside of the UK
- ☒ None of the above

B2.4 Is this project being undertaken as part of a larger research study for which a Manchester Metropolitan application for ethical approval has already been granted or submitted?

- ☐ Yes
- ☒ No

Data

F1 How and where will data and documentation be stored?

I will ensure that I protect anonymity and also store my dataset using the Manchester Metropolitan OneDrive account.

F2 Will you be using personal data? Personal data is anything that can be used to identify a living individual, directly or indirectly. Pseudonymised data is still personal data.

- ☐ Yes
- ☒ No

Insurance

F3 Does your project involve:

- ☐ Pregnant persons as participants with procedures other than blood samples being taken from them? (see info button)
- ☐ Children aged five or under with procedures other than blood samples being taken from them? (see info button)
- ☐ Activities being undertaken by the lead investigator or any other member of the study team in a country outside of the UK as indicated in the info button? If 'Yes', please refer to the 'Travel Insurance' guidance on the info button
- ☐ Working with Hepatitis, Human T-Cell Lymphotropic Virus Type iii (HTLV iii), or Lymphadenopathy Associated Virus (LAV) or the mutants, derivatives or variations thereof or Acquired Immune Deficiency Syndrome (AIDS) or any syndrome or condition of a similar kind?
- ☐ Working with Transmissible Spongiform Encephalopathy (TSE), Creutzfeldt-Jakob Disease (CJD), variant Creutzfeldt-Jakob Disease (vCJD) or new variant Creutzfeldt-Jakob Disease (nvCJD)?
- ☐ Working in hazardous areas or high risk countries? (see info button)
- ☐ Working with hazardous substances outside of a controlled environment?
- ☐ Working with persons with a history of violence, substance abuse or a criminal record?
- ☒ None of the above

Additional Information

G1 Do you have any additional information or comments which have not been covered in this form?

- ☐ Yes
☒ No

G2 Do you have any additional documentation which you want to upload?

- ☐ Yes
☒ No

Signatures

H1 I confirm that all information in this application is accurate and true. I will not start this project until I have received Ethical Approval.

- ☒ I confirm

H2 Please notify your supervisor that this application is complete and ready to be submitted by clicking "Request" below. Do not begin your project until you have received confirmation from your supervisor - it is your responsibility to ensure that they do this.

Signature Request: Signature requested from Raheem Sarwar on 23/07/2025 11:02 PM

H3 Have you been instructed by your supervisor to request a second signature for this application?

- ☐ Yes
☒ No

H4 By signing this application you are confirming that all details included in the form have been completed accurately and truthfully. You are also confirming that you will comply with all relevant UK data protection laws, and that that research data generated by the project will be securely archived in line with requirements specified by the University, unless specific legal, contractual, ethical or regulatory requirements apply.

Signed: This form was signed by Jennifer Maliki (JENNIFER.MALIKI@stu.mmu.ac.uk) on 23/07/2025 11:02 PM