

**National College of Ireland**

**Project Submission Sheet**

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| **Student Name:** | Robin Richard Siibak  ……………………………………………………………………………………………………………… | | |
| **Student ID:** | X23404092  ……………………………………………………………………………………………………………… | | |
| **Programme:** | Data Science  ……………………………………………………………… | **Year:** | 2nd year  ……………………… |
| **Module:** | Data Mining & Machine Learning ………………………………………………………………………………………………………… | | |
| **Lecturer:** | Arghir Nicolae Moldovan  ……………………………………………………………………………………………………………… | | |
| **Submission Due Date:** | 25/04/25 23:55  ……………………………………………………………………………………………………………… | | |
| **Project Title:** | Cybersecurity Intrusion Detection Using Machine Learning: A Comparative Study with Python and Weka……………………………………………………………………………………………………………… | | |
| **Word Count:** | 2932  ……………………………………………………………………………………………………………… | | |

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.

ALL internet material must be referenced in the references section. Students are encouraged to use the Harvard Referencing Standard supplied by the Library. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action. Students may be required to undergo a viva (oral examination) if there is suspicion about the validity of their submitted work.

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| **Signature:** | ROBIN SIIBAK  ……………………………………………………………………………………………………………… |
| **Date:** | 25/04/2025  ……………………………………………………………………………………………………………… |

**PLEASE READ THE FOLLOWING INSTRUCTIONS:**

1. Please attach a completed copy of this sheet to each project (including multiple copies).

2. Projects should be submitted to your Programme Coordinator.

3. **You must ensure that you retain a HARD COPY of ALL projects**, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer. Please do not bind projects or place in covers unless specifically requested.

4. You must ensure that all projects are submitted to your Programme Coordinator on or before the required submission date. **Late submissions will incur penalties.**

5. All projects must be submitted and passed in order to successfully complete the year. **Any project/assignment not submitted will be marked as a fail.**

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| **Office Use Only** | |
| Signature: |  |
| Date: |  |
| Penalty Applied (if applicable): |  |

AI Acknowledgement Supplement

# [Data Mining & Machine Learning]

# [Cybersecurity Intrusion Detection Using Machine Learning: A Comparative Study with Python and Weka]

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| --- | --- | --- |
| **Your Name/Student Number** | **Course** | **Date** |
| **Robin Siibak/ 23404092** | BSDHS2 – DMML | 25/04/2024 |

This section is a supplement to the main assignment, to be used if AI was used in any capacity in the creation of your assignment; if you have queries about how to do this, please contact your lecturer. For an example of how to fill these sections out, please click [here](https://libguides.ncirl.ie/useofaiinteachingandlearning/studentguide).

# AI Acknowledgment

This section acknowledges the AI tools that were utilized in the process of completing this assignment.

|  |  |  |
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| **Tool Name** | **Brief Description** | **Link to tool** |
| **Grammarly, Chat GPT,**  **Anaconda AI** | Assisted in the grammatical enhancement of text, ensuring clarity, effective word choice, and sentence structure. | <https://www.grammarly.com>  <https://www.anaconda.com>  https://chatgpt.com |
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# Description of AI Usage

This section provides a more detailed description of how the AI tools were used in the assignment. It includes information about the prompts given to the AI tool, the responses received, and how these responses were utilized or modified in the assignment. **One table should be used for each tool used**.

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| --- | --- |
| **Grammarly** | |
| **When writing my research paper, I utilized Grammarly's enhancement features to clarify and improve the selected text. By combining this method with Grammarly’s active corrections and highlights, I ensured that my writing was as informative and coherent as possible. Anacondas AI was used occasionally on selective programming to fix/ enhance certain mechanisms. Chat GPT gave format feedback on any statistical visuals that were apart of the submission** | |
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**EXAMPLE TEXT:**

**Original:**

**This project looked at how machine learning can help spot cyber security intrusion using the cybersecurity dataset[1]. We tested three different types of models — Logistic Regression, Random Forest, and Boosting methods (XGBoost in Python and AdaBoostM1 with J48 in Weka) — and ran them on both Python and Weka to make sure the results were reliable and consistent across different tools.**

**Grammarly Altered:**

Make this more comprehensive, This study demonstrated the application of machine learning models to the problem of cybersecurity intrusion detection using a recent, real-world dataset. Three supervised classification algorithms—Logistic Regression, Random Forest, and Boosting-based classifiers (XGBoost in Python and AdaBoostM1 with J48 in Weka)—were evaluated across two platforms to ensure robustness, reproducibility, and cross-tool validation