ASSESSMENT AND INTERNAL VERIFICATION FRONT SHEET (Individual Criteria)

(Note: This version is to be used for an assignment brief issued to students via Classter)

Course Title	**B.Sc. (Hons.) Software Development, B.Sc. (Hons.) Computer Systems & Networking, B.Sc. (Hons.) Multimedia Software Development**	**Lecturer Name & Surname**	Clifford De Raffaele Frankie Inguanez Neville Magri Daren Scerri
Unit Number & Title	ITRSH-506-2101 – Research Design 1		
Assignment Number, Title / Type	01, Research Project / Home		
Date Set	05/02/2024	**Deadline Date**	17/05/2024
Student Name		**ID Number**	**Class / Group**

Assessment Criteria	Maximum Mark
KU1.1 Present gathered research in relation to a theme that motivates research in an area/topic.	5
SE1.2 Formulate a research hypothesis, supported with research questions from which research methods will be derived.	10
AA1.3 Illustrate a research pipeline that will be followed to address own research hypothesis.	7
KU1.4 Clarify which research methods will be used to address the identified research questions and how these will be evaluated.	5
AA1.5 Apply every stage of the research pipeline to own research endeavor.	7
KU2.1 Outline the current state of the art of own research topic (h/w, data, alg).	5
KU2.2 Describe different existing sources of data with key features and uses in different research.	5
AA2.3 Contrast own research findings with that of current state of the art.	7
KU3.1 Defend the proposed pipeline by citing own results and that of the current state of the art.	5
SE3.2 Evaluate the outcome of each identified research question.	10
AA3.3 Investigate the extent to which results confirm original hypothesis.	7
AA3.4 Investigate areas in which results suggest the original hypothesis needs modification.	7
KU4.1 Record the work in a report following a proper referencing style.	5
KU4.2 Arrange own work in a scientifically structured manner with proper internal referencing, sectioning and labelling.	5
SE4.3 Criticize own research to propose new hypothesis and research questions for future work.	10
Total Mark	100

Notes to Students:

- This assignment brief has been approved and released by the Internal Verifier through Classter.
- Assessment marks and feedback by the lecturer will be available online via Classter (Http://mcast.classter.com) following release by the Internal Verifier
- Students submitting their assignment on Moodle/Turnitin will be requested to confirm online the following statements:

Student's declaration prior to handing-in of assignment

- ❖ I certify that the work submitted for this assignment is my own and that I have read and understood the respective Plagiarism Policy

Student's declaration on assessment special arrangements

- ❖ I certify that adequate support was given to me during the assignment through the Institute and/or the Inclusive Education Unit.
- ❖ I declare that I refused the special support offered by the Institute.

Overview

This unit aims to aid you in formulating an understanding of a research project following a scientific research methodology. A staggered assessment approach shall be undertaken, so that you can build your project gradually. Regular communication with your lecturer is key. Following is a schedule and outline of the milestones and respective deliverables:

Schedule

Milestone	Deliverable	Percentage	Deadline
01	Research Introduction	10%	23/02/2024
02	Literature Review	15%	29/03/2024
03	Research Methodology	12%	26/04/2024
04	Final prototype + Paper	53%	17/05/2024
05	VIVA Presentation	10%	20-30/05/2024

Milestone 01: Research Introduction

1. Create a GitHub private repository and call it **com.mcast.research_design_I_2023.<surname>_<name>**, replacing <surname> and <name> with your actual name. Share this repository with your respective lecturer. Clone the repository on your local computer and commit regularly. Create and maintain the following structure:
    - **doc:** Upload the assignment brief.
    - **lit:** Any academic papers that you refer to and cite in your final paper.
    - **src:** The source code and data of your prototype. Consult with your respective lecturer on whether this folder should be included on your Git repository or elsewhere especially in games development that require very large files. Also be mindful of large datasets.
    - **deliverables:** All deliverables that will be requested of you.
2. Propose a research topic that you want to research. For the chosen topic you need to provide:
    - Research aim.
    - Research hypothesis.
    - Three research questions.
    - Inspirational sources (previous projects, dissertations, blogs).

P.S. This task requires a certain amount of research, communication, and reflection. Consider reviewing past dissertations, speaking with your lecturer, reflect on the current context, what you want to pursue and what your strong points are. Consider making use of tools such as a Kanban board to organise your thoughts and address key aspects of your research such as what is shown below.

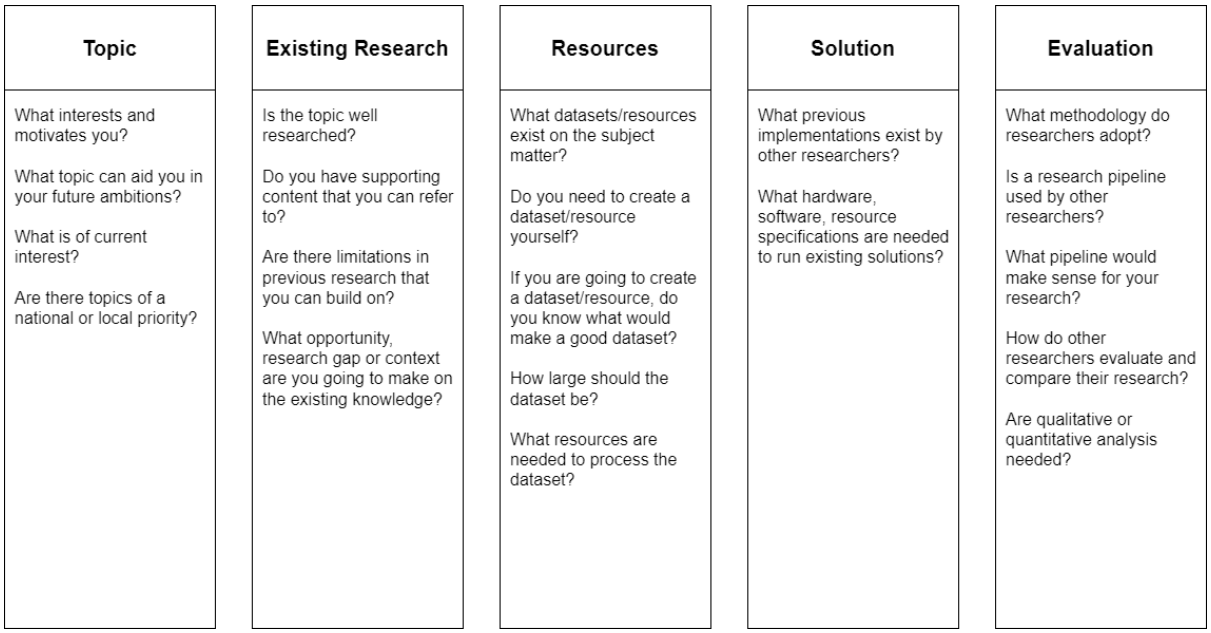

Figure 1 - Sample Research Ideation Kanban Board

Milestone 02: Early Literature Review

1. Identify 5 recent (post 2018) academic sources that are related to the research area.
2. Prepare a literature map of the chosen papers. This is a visual illustration with your research topic/question at the centre leading to key literature streams (points of discussion/concern), leading to the identified papers. Please note that an identified paper can be listed under multiple literature streams.
3. Provide an in-depth literature review of the identified papers (around 1,000-1,500 words). For each paper identify the research aim, dataset (if relevant) used, solution/algorithms implemented, evaluation, limitations, and recommendations.
4. Provide comparison table(s) whereby you list each paper and key features that can be compared.

P.S. Following are sample comparison tables and literature map about research in machine learning (discuss with your respective lecturer if your chosen topic might not have a specific component, such as research in game development that might not have a dataset for research purposes):

Figure 2 – Sample dissertation level Literature Map

Table 1 – Sample dissertation level Dataset comparison

Study	Accessible	Source	Training images	Testing images
Yilmaz et al. [4]	No	Metedec	N/S	N/S
Elmogy et al. [3]	No	Igurco Gestion S.L & Medetec	116	77
Chang et al. [12]	No	Far Eastern hospital	2,393	598
Patel [1]	No	AZH Wound & Vascular Center	3,645	405
Lau et al. [23]	No	Not specified	1,278	144
Veredas et al. [21]	No	Clinicians in a Care Home	113	N/S
Wang et al. [2]	Yes [10]	AZH Wound & Vascular Center	3,645	405
Huang et al. [5]	No	Taichung Rongmin General Hospital	2,800	800

N/S - Representing 'Not Specified'.

Milestone 03: Research Methodology

1. Determine whether the research aim, hypothesis and questions previously proposed need to be revised.
2. Propose a pipeline/plan for your research and prepare an illustration. Some sort of experimentation is needed for evaluation purposes. Use your early literature review as inspiration for candidate pipelines in your chosen subject area.
3. Propose research methods that you will adopt to gather data and evaluate your research prototype. The research methods should align with other research identified in the literature review.

P.S. In your third year you will delve deeper into the research paradigm, yet you might want to explore this and discuss with your lecturer.

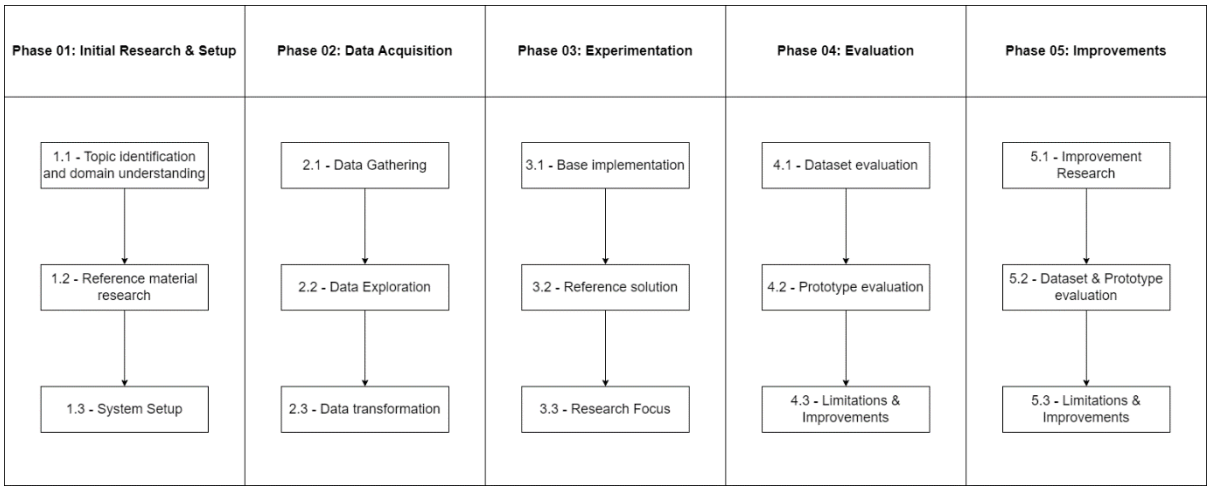

Figure 3 - Sample research pipeline

Milestone 04: Final prototype

1. The source code for the final working prototype.
2. The dataset(s), if relevant, used for the experimentation.
3. A 3–5-page paper using IEEE conference template (Word or LaTeX) in PDF form. The paper should have the following:
    a. Title, with author and affiliation details.
    b. A 150-200 word abstract that outlines the aim of the research, the research methods adopted, and results achieved.
    c. 3 to 5 keywords that define your research.
    d. An introduction that outlines the purpose, motivation, and importance of this research. It is recommended to include the research aim, hypothesis, and question(s) here.
    e. A literature review that is a refinement/improvement of the second deliverable.
    f. A research methodology that is a refinement/improvement of the third deliverable and the actual executed approach.
    g. A findings section in which you outline the results of your experiment/research. Compare your research with that of other researchers identified in the literature review. Evaluate the research questions and hypothesis.
    h. A conclusion section that outlines what was achieved, a critical analysis of the research specifying limitations of the research and possible future recommendations such as alternate hypotheses.
    i. References in accordance with the IEEE template.

P.S. It is strongly recommended that you use LaTeX and an online editor as Overleaf. For your dissertation you will be provided with a LaTeX template that takes care of all formatting.

Milestone 05: VIVA

1. Prepare a 10-minute presentation that is structured in a very similar way to the paper. It is recommended to include a 2-minute video of the prototype.
2. Deliver the presentation to your lecturer.

Grading Criteria

Milestone 01 – Grading Criteria

Criteria / Task	Low Performance	Average Performance	Best Performance
SE1.2	1-3	4-6	7-10
Identified research	Proposed research is broad, lacking direction or context.	Proposed research identifies key technologies and context yet is lacking depth of thought.	Proposed research is detailed, relevant to specific context and based on good background research.
Research hypothesis	Hypothesis is generic and lacking rigor.	Hypothesis specifies research direction and correlates well with research questions.	Hypothesis is well defined and encapsulates the research direction well.
Research questions	One or two research questions provided that are loosely linked to research hypothesis or are too generic.	Three research questions provided but are lacking depth of thought.	Three research questions provided, contextualised to research, and showing depth of thought.

Milestone 02 – Grading Criteria

Criteria / Task	Low Performance	Average Performance	Best Performance
KU1.1	1-2	3	4-5
Reviewed papers	One or two papers referenced are related to the research topic.	Three papers referenced are related to the research topic.	Four to five recent papers referenced are related to the research topic.
Depth of review	Review is shallow, giving generic information and lacking flow.	Papers are reviewed giving a considerable overview of the research undertaking.	Reviewed papers are represented wholistically and contribute well to this research.

Criteria / Task	Low Performance	Average Performance	Best Performance
KU2.2	1-2	3	4-5
Review of data sets / resources	A listing of existing datasets with limited information such as author, creation year and basic features given.	Review of datasets or resources used in research are explained in some detail.	Datasets or resources are reviewed in detail highlighting opinions by other researchers which aids in the defence of choosing a specific dataset or in the decisions taken to create a custom dataset.

Criteria / Task	Low Performance	Average Performance	Best Performance
KU2.1	1-2	3	4-5
Review of state-of-the-art	A listing of existing approaches/solutions with limited information such as author, creation year and basic features given.	Review of different approaches/solutions used in research are explained in some detail.	Solutions or approaches are reviewed in detail highlighting opinions by other researchers which aids in the defence of choosing a solution/approach or in the decisions taken.

Milestone 03 – Grading Criteria

Criteria / Task	Low Performance	Average Performance	Best Performance
KU1.4	1-2	3	4-5
Proposed research methods	Research method provided with limited explanation of data gathering or experimentation.	Research method provided with detailed approach for data gathering and experimentation.	Excellent choice of research method(s) proposed, aligning with other research. Use of existing resources and creation of own, with experimentation that allows for comparison with third party.

Criteria / Task	Low Performance	Average Performance	Best Performance
AA1.3	1-3	4-5	6-7
Proposed research pipeline/plan	A basic generic pipeline/plan, that does not show inspiration from existing literature or does not show research rigour.	A pipeline/plan that shows rigour and structure, aiding in the undertaking of the research project.	A pipeline/plan inspired from existing literature and contextualised for the research.

Milestone 04 – Grading Criteria

Criteria / Task	Low Performance	Average Performance	Best Performance
KU4.1	1-2	3	4-5
Referencing style	Referencing style used poorly, with substantial missing fields.	Referencing style used properly. Yet some fields are missing such as DOI, incorrect abbreviation of authors, missing URL, or other fields such as accessed date.	Referencing style used properly. Citations are constructed properly with DOI, correct use of corporate author if relevant, accessed date if relevant.

Criteria / Task	Low Performance	Average Performance	Best Performance
KU4.2	1-2	3	4-5
Scientific Paper	Template not used properly, and paper not structured as expected.	Paper follows general template and provides guidelines, yet shortcomings are visible.	Template and submission guidelines followed perfectly.

Criteria / Task	Low Performance	Average Performance	Best Performance
KU3.1	1-2	3	4-5
Executed research pipeline defence in research methodology	A generic pipeline is provided with no justification or reference to other research.	A good pipeline is presented with very limited justification or reference to other research.	A good pipeline is presented with citations for inspiration and comparison.

Criteria / Task	Low Performance	Average Performance	Best Performance
AA1.5	1-2	3-4	5-7
Documentation of work undertaken in the Findings & Results section (ideally following pipeline)	Even though work is documented, it is difficult at what stage of the pipeline it occurred.	Work is documented and referenced along the research pipeline yet is limited in detail.	Work is documented rigorously and referenced well along the research pipeline.
Prototype demonstration	Basic demonstration of working prototype with some errors or flaws.	Complete demonstration of working prototype with some flaws.	Demonstration of working prototype and experimentation.

Criteria / Task	Low Performance	Average Performance	Best Performance
AA2.3	1-2	3-4	5-7
Comparison with other work	Limited to no comparison of own work with third party.	Comparison of work done with third party, yet evaluation does not align perfectly.	A fair comparison of own work with third party using same evaluation technique/metric.

Criteria / Task	Low Performance	Average Performance	Best Performance
SE3.2	1-3	4-6	7-10
Research question evaluation	Research questions are poorly or incorrectly answered.	Research questions are answered yet are biased or lacking rigour.	Research questions are answered with rigour and in a fair manner.

Criteria / Task	Low Performance	Average Performance	Best Performance
AA3.3	1-2	3-4	5-7
Hypothesis evaluation	Hypothesis is poorly evaluated.	Hypothesis is evaluated but contains bias.	Hypothesis is evaluated fairly and rigorously.

Criteria / Task	Low Performance	Average Performance	Best Performance
AA3.4	1-2	3-4	5-7
Alternate Hypothesis proposed	One superficial alternate hypothesis proposed.	Various alternate hypotheses proposed with no or little justification.	Alternate hypotheses proposed evidenced with results from research.

Milestone 05 – Grading Criteria

Criteria / Task	Low Performance	Average Performance	Best Performance
SE4.3	1-3	4-6	7-10
VIVA presentation	A basic presentation of work with limited to no criticism	A good presentation of work, with fair self-criticism, yet superficial future recommendations.	An excellent presentation of work, with identified limitations, recommended new and meaningful hypothesis, research questions and future work.