MCAST

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	03/02/2024	**Deadline Date**	23/03/2024		
Student Name	Sherdan Caruana	**ID Number**	**0459302I**	**Class / Group**	**6.2A**

Assessment Criteria	Maximum Mark
SE1.2 Formulate a research hypothesis, supported with research questions from which research methods will be derived.	10
Total Mark	10

MCAST

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.

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.

Topic	Existing Research	Resources	Solution	Evaluation
What interests and motivates you? What topic can aid you in your future ambitions? What is of current interest? Are there topics of a national or local priority?	Is the topic well researched? Do you have supporting content that you can refer to? Are there limitations in previous research that you can build on? What opportunity, research gap or context are you going to make on the existing knowledge?	What datasets/resources exist on the subject matter? Do you need to create a dataset/resource yourself? If you are going to create a dataset/resource, do you know what would make a good dataset? How large should the dataset be? What resources are needed to process the dataset?	What previous implementations exist by other researchers? What hardware, software, resource specifications are needed to run existing solutions?	What methodology do researchers adopt? Is a research pipeline used by other researchers? What pipeline would make sense for your research? How do other researchers evaluate and compare their research? Are qualitative or quantitative analysis needed?

Figure 1 - Sample Research Ideation Kanban Board

Research Aim: Using: To investigate the effectiveness of adding computer vision algorithms for pedestrian detection and safety enhancement while driving, along with the identification and mitigation of jaywalking incidents, in reducing pedestrian-related accidents and fatalities, while concurrently improving driver awareness on the road.

Research Hypothesis: Implementing computer vision algorithms for pedestrian detection and safety enhancement during driving, coupled with the identification and mitigation of jaywalking incidents, can significantly reduce pedestrian-related accidents and fatalities, while also enhancing driver awareness on the road.

Research Questions:
1. How will lighting affect the detection process?
2. How will the hardware effect the framerate and image quality?
3. How can the lane detection dataset and pedestrian detection dataset be combined to accurately identify when pedestrians are on roads?

Inspirational Sources:
https://www.kaggle.com/datasets/karthika95/pedestrian-_detection
https://www.kaggle.com/datasets/smeschke/pedestrian-dataset/data
https://www.v7labs.com/blog/semantic-segmentation-guide
https://ieeexplore.ieee.org/abstract/document/10000957
https://www.youtube.com/watch?v=KzRkS-8oNtc
https://www.youtube.com/watch?v=x70ALxNzKto
https://debuggercafe.com/road-segmentation-using-segformer/
https://debuggercafe.com/training-segformer-for-person-segmentation/
https://huggingface.co/docs/transformers/en/model_doc/segformer

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.