**282.762 – Robotics and Automation – Assignment 1**

**Aim:**

To implement an image processing algorithm that can determine the edges of an image.

**Objectives:**

* To be able to take an algorithm used in image processing for detecting edges and implement it yourself.

**Description:**

You are required to write a program that implements an image processing algorithm that can detect the edges of an image.

**Constraints:**

* You must use the sample image provided.

**Resources:**

* You will be provided with a sample image.

**Method of Assessment:**

* You will be required to submit your program for testing.
* You will be required to submit a report about you program.

A grade out of 20 marks will be given for implementing an image processing algorithm that can detect edges.

A grade out of 30 marks will be given for the report.

Assignment 1 will be out of a total grade of 50 marks.

**Additional Information:**

Assignment 1 assesses the following learning outcomes:

1. Use artificial vision and optimization methods in artificial vision.

Assignment 1 accounts for 10% of the 282.762 paper’s grade.

Assignment 1 is an individual project.

Do not simply use an OpenCV function for edge detection; this is not the purpose of this assessment.

The report should be no more than 5000 words.

**Implemented Algorithm Marking Rubric:**

The following rubric provides an overview of how marks will be allocated for the implemented algorithm.

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| --- | --- | --- | --- | --- |
| **Demonstration** |  |  |  | **20 Marks** |
| 0 | 0-5 | 5-10 | 10-15 | 15-20 |
| No algorithm implemented. | An algorithm was marginally implemented. | An algorithm was partially implemented. | An algorithm was largely implemented. | An algorithm was completely implemented. |
|  | e.g. the student used OpenCV function for edge detection. | e.g. an algorithm was partially implemented using the student and their code and some OpenCV functions. | e.g. an appropriate algorithm was largely implemented using the student and their code. | e.g. an appropriate algorithm was implemented completely by the student and their code. |
| No effort applied. | Minimal effort applied. | Below average effort applied. | Average effort applied. | Above average effort applied. |

**Report Marking Rubric:**

The following rubric provides an overview of how marks will be allocated for the report.

|  |  |  |  |
| --- | --- | --- | --- |
| **Introduction/Aim/Objective** |  |  | **5 Marks** |
| 0 | 1 - 2 | 3 - 4 | 4 - 5 |
| No introduction, aim, or objective provided. | Simple introduction, aim, and objective provided. | Average introduction, aim, and objective provided. | Above average introduction, aim, and objective provided. |
|  | E.g. Copy of project brief’s introduction, aim, and objective. | E.g. Copy of project brief’s introduction, aim, and objective.  Some personal aims, objectives. | E.g. Reference to project brief’s introduction, aim, and objective. Personalised introduction, aim, and objective. Clear overview of project. |
| No effort applied. | Minimal effort applied. | Average effort applied. | Above average effort applied. |

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| --- | --- | --- | --- |
| **Methodology/Solution** |  |  | **15 Marks** |
| 0 | 1 - 5 | 6 - 10 | 11 - 15 |
| No Methodology provided. | Simple methodology provided. | Average methodology provided. | Above average methodology provided. |
|  | E.g. Simple description of what was done. | E.g. Moderate description of what was done and how. | E.g. Detailed description of what was done, how, and why. |
| No effort applied. | Minimal effort applied. | Average effort applied. | Above average effort applied. |

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| **Results/Discussion/Conclusion** |  |  | **5 Marks** |
| 0 | 1 - 2 | 3 - 4 | 4 - 5 |
| No results, discussion, and conclusion provided. | Simple results, discussion, and conclusion provided. | Average results, discussion, and conclusion provided. | Above average results, discussion, and conclusion provided. |
|  | E.g. Simple description of project outcome, minimal discussion, and simple conclusion provided. | E.g. Moderate description of project outcome, some discussion, and average conclusion provided. Some critical evaluation of processes and methodology provided. | E.g. Detailed description of project outcome, detailed discussion and above average conclusion provided. Detailed critical evaluation of processes and methodology provided. |
| No effort applied. | Minimal effort applied. | Average effort applied. | Above average effort applied. |

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| --- | --- | --- | --- |
| **Presentation/Structure** |  |  | **5 Marks** |
| 0 | 1 - 2 | 3 - 4 | 4 - 5 |
| No presentation. | Simple presentation and structure. | Average presentation and structure. | Above average presentation and structure. |
|  | E.g. Report consists of a “wall of text”. No figures. No tables. No clear structure. | E.g. Report has some structure. Includes some figures. Includes some tables. | E.g. Report has appropriate balance between text, figures, and tables. Excellent structure; includes table of contents, list of figures, sections, and captions. |
| No effort applied. | Minimal effort applied. | Average effort applied. | Above average effort applied. |