



**IMAGE PROCESSING, COMPUTER VISION AND PATTERN RECOGNITION  
(CT036-3-IPPR)  
IN-COURSE ASSESSMENT  
(ASSIGNMENT - GROUP ASSIGNMENT)**

**Intake** : APU3F/D3F/APU3F/D3F/2511CS/CS(AI)  
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**Due date** : 5<sup>TH</sup> MARCH, 2026

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<b><i>IMAGE SEGMENTATION, DETECTION AND RECOGNITION</i></b>
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## **1.0 THE ASSIGNMENT OVERVIEW**

This group assignment allows the students to work collaboratively to provide a solution to detect defects in gloves using image processing and computer vision applications. The gloves used will be determined by your group.

## **2.0 OBJECTIVES OF THIS PROJECT:**

**Overall objectives:** Equip students with practical knowledge about image processing, computer vision and pattern recognition in programming and computing. The focus will not be on teaching all of the details of programming under specific platforms, but rather on providing both a high-level understanding and practical implementation experience of reusable algorithms and coding techniques that apply to the development of applications across different platforms and genres.

### Project specific objectives:

Provide a solution to automatically detect the defects in gloves through image processing and computer vision.

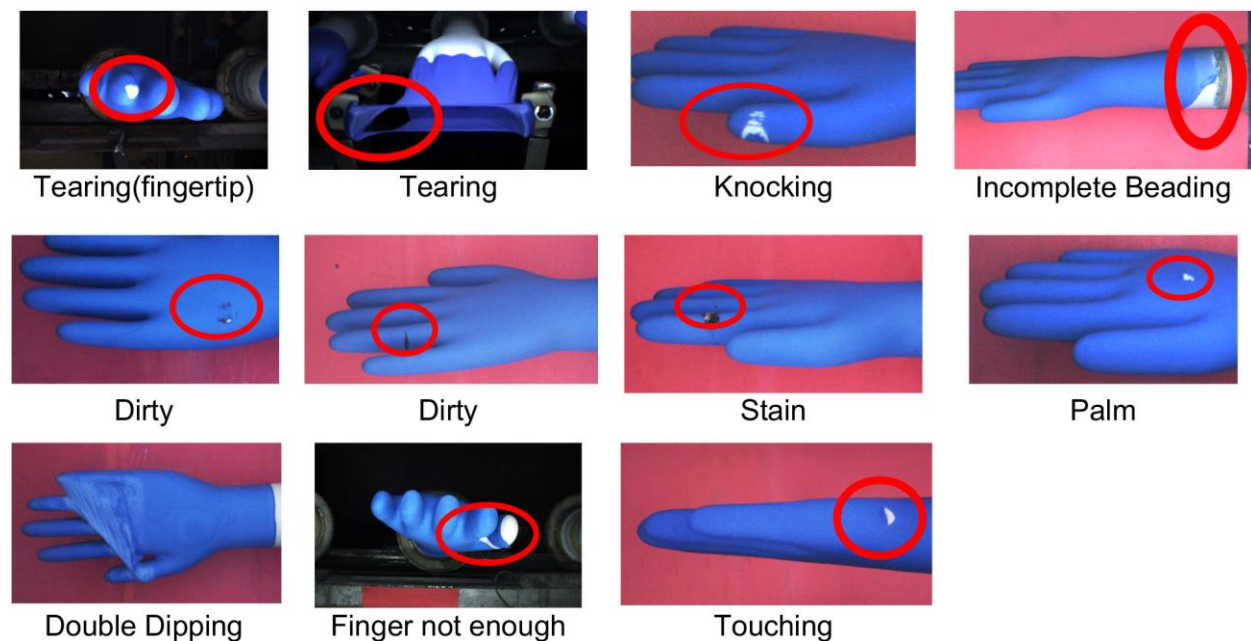
### 3.0 LEARNING OUTCOMES:

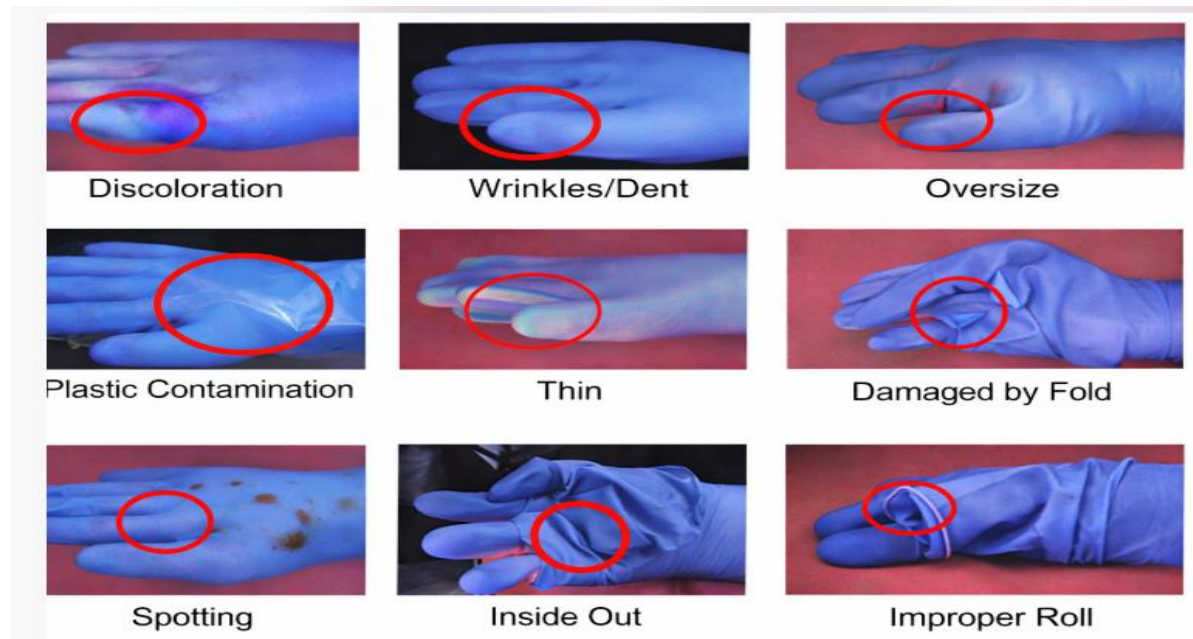
At the end of this project, the students should be able to:

- ❖ Design and implement a software artifact that processes images for computer vision and pattern recognition for a given problem domain using appropriate methods.
- ❖ Make a selection between candidate techniques based upon a rational critical evaluation of the requirements of a particular problem.

### 4.0 PROJECT REQUIREMENTS:

Your goal is to detect the gloves in any given image and segment & recognize the defects from it. You will need to survey and select candidate techniques to be used in the project. Provide justification for the choices made, including in any libraries and data used. You will need to design and implement a gloves defect detection (GDD) system, and then test the system to evaluate the accuracy of the proposed techniques. The challenge of the project is that the system must be robust enough to identify different defects in the gloves as shown in figure 1.





*Figure 1: Different possible defects in glove inspection*

**Note:**

- This assignment is to be carried out as group work. Students will also be assessed individually on their contributions to the assignment.
- Glove identification/detection must be done for at least 3 types of gloves.
- Minimum 3 defects must be identified by every group member.
- A GUI has to be developed, and the system must be updated to show the types of defects.
- The system must not be sensitive to environmental changes (**Haar Cascade, Tensorflow and pattern matching methods should not be used**).

**5.0 DELIVERABLES:**

In addition, a supporting document is to be produced to reflect on the methodologies and implementation tasks applied in the development of the application. In terms of documentation, you are required to describe and justify the theoretical information about the image processing and computer vision algorithms used. To fulfil the objective of this coursework, you are also required to describe the results of testing using various test images. Pay particular attention in providing critical analysis for cases of images that fail.

## 5.1 PROTOTYPE APPLICATION

- ❖ An individual screencam demonstration of the completed application is to be submitted. Presentation should be done individually by every member of the group and the presentation will last approximately 10-15 minutes.
- ❖ All relevant source code are to be provided. The code should be well commented to enable ease of understanding.
- ❖ All test files (e.g. \*.jpg, \*.gif, etc.) are to be provided.

## 5.2 DOCUMENTS: PROJECT REPORT

As part of your assessment, you will have to submit a project report which includes the followings:

- Table of contents
  - Contribution matrix
  - Acknowledgement
  - Abstract: The objectives of this project (200-300 words)
  - Introduction: Analysis of the problem
  - Description and justification of the proposed algorithms/methods/techniques
  - Experimental Results
  - Description and discussion on the obtained results
  - Critical comments, analysis and future work direction
  - Conclusion
  - List of References (Scholarly references, not wiki, personal websites, blogs, forums)
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- ❖ The front cover should be presented with the following details:
    - a) Group members Names and corresponding Student ID numbers
    - b) Intake code
    - c) Module Code and Module Name
    - d) Assignment Title
    - e) Date Completed (the date the report is due to be handed in)

**Note:**

- ❖ The length of the report should be approximately 2500 – 3000 words.
- ❖ You may source information from the Internet. Cite all sources.
- ❖ All in-text citations and in the References must be made using the APA Convention.

**6.0 ASSESSMENT CRITERIA**

- ❖ The project will be assessed based on the following key areas:

	Criteria	Marks Allocated
1	Description and justification of the candidate techniques/methods/algorithms with details of the implementation	50%
2	Experimental Results & Critical analysis	40%
3	Prototype (Demo and Presentation)	10%

**7.0 DEVELOPMENT TOOLS**

- ❖ Development for the assignment is expected in MATLAB. However, alternative programming languages, libraries and tools may be used with justification & discussion with the teacher.

**8.0 ACADEMIC INTEGRITY**

- ❖ You are expected to maintain the utmost level of academic integrity during the duration of the course.
- ❖ **Plagiarism** is a serious offence and will be dealt with according to APU's regulations on plagiarism.

**9.0 WORKLOAD MATRIX:**

All members are required to sign off your workload matrix, before submitting your assignment.

**Note:** For presentation, every single member of the group has to do the presentation individually.