600100 Computer Vision - CRG

ACW - Counting Starfish

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Learning Outcome	Criterion	Pass	2:2	2:1	1st	Upper 1st
[LO1] Demonstrate a knowledge and understanding of image processing and computer vision techniques, the properties of image data and be able to solve problems about extraction of features and other quantitative information.	Detailed report outlining techniques, and justification for steps taken towards solving the image processing task(45%)	A basic pipeline is presented, but is lacking in justification. Results section missing.	In addition to previous. Justification is mostly correct, but contains some errors. Discussion is limited in depth, with few references to steps taken. Some results are provided, not all may be relevant.	In addition to previous. Justification is mostly correct, but contains some errors. Discussion covers most aspects of the pipeline, and is justified. Results cover most of the test images provided and are relevant. May include additional empirical evidence.	In addition to previous. Report is well-written, with strong justification of design choices made within the pipeline, taken from empirical evidence gathered. Discussion fully covers all aspects of the pipeline. Including in-depth comparisons between approaches as applied to the image processing task. Results cover all test images provided. Includes any relevant results which highlight and emphasise justification.	In addition to previous. Results presented include exploratory entries facilitating additional discussion. Discussion provides commentary on the wider-context of the methods applied. Critiquing their use on images from the domain, including their limitations.
[LO2] Critically analyse, research and report on the concepts of data, information and knowledge within a computer vision system.						

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[LO3] Design, implement and test a program for the analysis of image data and prepare a technical report on the evaluation of this program on suitable test data.	Creation of an Image Processing Pipeline within MATLAB for detecting Starfish within given images (55%)	A basic pipeline is presented by may contain some errors on the default Starfish Visual evidence of pipeline stages may be missing or erroneous. Program may lack visual output.	In addition to previous. Visual evidence of major pipeline stages is clearly presented and displayed. Program output is clear, with labelling.	In addition to previous. All 5 Starfish are detected appropriately in the default Starfish.jpg image. Some additional starfish images (based off starfish.jpg) may be attempted, but not fully detected. Commenting is present, but may be missing in some sections. Visual output of the MATLAB code shows major pipeline steps Pipeline function returns number of Starfish	In addition to previous. Additional starfish images (based off starfish.jpg) are attempted, with good detections on the majority of alternative images. Some non-standard starfish images may be attempted, but detections may not be accurate. Pipeline is thoughtfully designed, taking into consideration multiple pathways of processing; function return includes number of starfish as well as bounding box coordinates of all detected objects. Some advanced techniques may be utilised from literature. Visual output of the pipeline includes augmentation of the original input image with identifying markers (e.g boxes, circles, alpha masks). MATLAB code provided is well-written, with good use of commenting. Some custom implementations are utilised in-place of MATLAB built-in functions.	In addition to previous. All default detections, alternative detections, and a number of non-standard starfish are detected. Advanced techniques from literature are researched, understood, implemented, tested, and evaluated appropriately. MATLAB code quality is outstanding, showing excellent separation of pipeline stages, with good use of commenting and flow.

Weighting	All criteria are weighted as shown by the percentages indicated in the relevant criterion box.	