

CSCM77 Computer Vision and Deep Learning

Coursework Mark Scheme: Pac-Man

Student Number: _____ Name: _____

Sub-task	Criteria	Mark
Loading data	<ul style="list-style-type: none">• Load training images with correct class labelling [1 mark]	/ 1
Feature extraction	<ul style="list-style-type: none">• Feature choice [1 mark]• Feature extraction on samples [1 mark]	/ 2
Classifier training	<ul style="list-style-type: none">• Correct training data and labels [1 mark]• Classifier selection and training [2 mark]	/ 3
Patch extraction	<ul style="list-style-type: none">• Projection of 3D scene view into 2D image [1 mark]• Extracting RGB patch at correct location [1 mark]• Are patches correctly orientated? [1 mark]• Feature extraction on testing samples [1 mark]	/ 4
Sphere detection	<ul style="list-style-type: none">• Utilising trained model [1 mark]• Obtaining predicted class for patch [1 mark]• Identifying closest detection [1 mark]	/ 3
Identifying new camera location	<ul style="list-style-type: none">• Projection of image coordinate to xyz space [1 mark]• Setting new camera position [1 mark]• Handling cases with no detection [1 mark]• Setting new camera orientation [1 mark]	/ 4
Scene updates	<ul style="list-style-type: none">• Is the scene and score updated? [1 mark]• Does game stop when all spheres are collected? [1 mark]	/ 2
Communication	<ul style="list-style-type: none">• Is the solution understood and presented? [1 mark]	/ 1
Comments		

Total mark: _____ / 20

Marking scheme breakdown (total 20 marks):

Loading data (1 marks):

The provided training images should be loaded correctly, producing some matrix of images with appropriate class labels assigned for each image.

Feature extraction (2 marks):

A suitable feature descriptor should be chosen, and used to extract features from the provided training images. The same feature descriptors should be obtained from both training and testing samples.

Classifier training (3 marks):

A suitable classifier should be selected. Training data and observation labels should be passed to the classifier training function in the correct format. Classifier hyper-parameters should be discussed.

Patch extraction (4 marks):

The current view into the scene should be correctly projected to a 2D image space. Patches should be extracted from each suitable image coordinate point. Extracted patches should be the correct orientation, with the correct dimensionality. Features extracted on the image patches should be correct.

Sphere detection (3 marks):

Correct usage of the trained model to obtain class predictions on extracted patches. Correct extraction of predicted class labels and probabilities to identify most likely sphere detection. Probabilities should be processed to locate the closest pixel of interest.

Identifying new camera locations (4 marks):

Is the closest high probability prediction selected as the new camera position? Is the correct XYZ coordinate location identified? Is the new camera position defined correctly? Is the pipeline able to correctly handle situations in which no sphere is detected? Is the new camera orientation correctly implemented?

Scene updates (2 marks):

Is the scene updated in the correct manner? Does a correct detection result in the sphere being removed from the scene? Is the score tracking vector updated correctly? Does the program stop when the game is finished?

Communication (1 marks):

Is the student able to accurately communicate their provided solution? Can they defend each part of their proposed pipeline and show that it completes the task?