



Computer Vision CSE 365

Course Project

Submitted To: **Engineer Amr Yassin**

Submitted By:

Mohamed Sameh 16p3061

Youssef Khaled 16p6040

Nour E-din Osama16p3043

Introduction

This report explains the program that requested as the final project of the computer vision course to read bubble sheet survey papers and outputs the answer.

The project is written in python and uses only the opencv library.

The following figure shows the sample that was supposed to be read by the program.

AIN SHAMS UNIVERSITY
I-Credit Hours Engineering Programs
(i.CHEP)

University of East London

End-Course/Module Evaluation

Course Code: _____ Course Name: _____ Gender: ☐ Male ☐ Female

Semester: ☒ Fall ☐ Spring ☐ Summer

Program: ☐ MCTA ☐ ENVR ☐ BLDG ☐ CESS ☒ ERGY ☐ COMM ☐ MANF
☐ LAAR ☐ MATL ☐ CISE ☐ HAUD

Mark as shown: ☒ CORRECT ☐ INCORRECT

Please use a ball-point pen or a thin felt tip. This form will be processed automatically.
Please follow the examples shown on the left hand side to help optimize the reading results.

It is important to us to get feedback from you about this course/module. The results of the survey are anonymised and individual comments are not identified, so please take the time to answer all the questions as fully as you can. Your feedback will be used to review this course/module and to plan for the future.
Please select one box for each question that best reflects your opinion.
Please do not identify any individuals (including staff names) in your comments.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Teaching Sessions					
1.1 The teaching on this course/module is intellectually stimulating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
1.2 Matters are explained well in the teaching sessions.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1.3 The teaching methods used helped me to learn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
1.4 Lecturers were good at explaining things.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
1.5 The course/module was academically challenging.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Course/Module Support					
2.1 I am aware of the course/module learning outcomes.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.2 The assessment requirements were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
2.3 I feel well supported on this course/module.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
2.4 Feedback on summative work was provided within the time specified	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2.5 The workload for this course/module is manageable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
2.6 The assessments completed so far stimulated my learning.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Course/Module Organization					
3.1 The course/module was well organized and ran smoothly.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.2 The course/module focused on what was set out in the student guide.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3.3 I have been able to contact staff when I needed to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
4. Course/Module Resources					
4.1 The course/module materials on Moodle are helpful in supporting my learning.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.2 The library resources for the course/module, including its digital resources, meet my needs.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4.3 I am satisfied with the quality of classroom facilities for this course/module.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Course/Module Satisfaction					
5.1 Overall, I was satisfied with my experience of this course/module.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5.2 I would recommend this course/module to another student	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

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And the following is the output image from our program

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End-Course/Module Evaluation

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Please select one box for each question that best reflects your opinion.
Please do not identify any individuals (including staff names) in your comments.

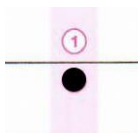
	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Teaching Sessions					
Q1: Disagree teaching on this course/module is intellectually stimulating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q2: Strongly Agree explained well in the teaching sessions.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q3: Disagree teaching methods used helped me to learn.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q4: Agree Lecturers were good at explaining things.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5: Strongly Agree module was academically challenging.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Course/Module Support					
Q6: Agree I am aware of the course/module learning outcomes.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q7: Strongly Disagree requirements were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q8: Disagree well supported on this course/module.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q9: Agree Feedback on summative work was provided within the time specified	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q10: Disagree workload for this course/module is manageable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Q11: Agree The assessments completed so far stimulated my learning.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Course/Module Organization					
Q12: Agree The course/module was well organized and ran smoothly.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q13: Strongly Agree module focused on what was set out in the student guide.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q14: Disagree been able to contact staff when I needed to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
4. Course/Module Resources					
Q15: Neutral the course/module materials on Moodle are helpful in supporting my learning.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q16: Strongly Agree resources for the course/module, including its digital resources, meet my needs.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q17: Neutral I am satisfied with the quality of classroom facilities for this course/module.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Course/Module Satisfaction					
Q18: Strongly Agree satisfied with my experience of this course/module.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q19: Neutral I would recommend this course/module to another student	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Description of Algorithm

The following are the brief step used to extract the answers from the images.

- First, the program creates 2 images one with the circles alone and one with the black squares alone and one with black circles alone.



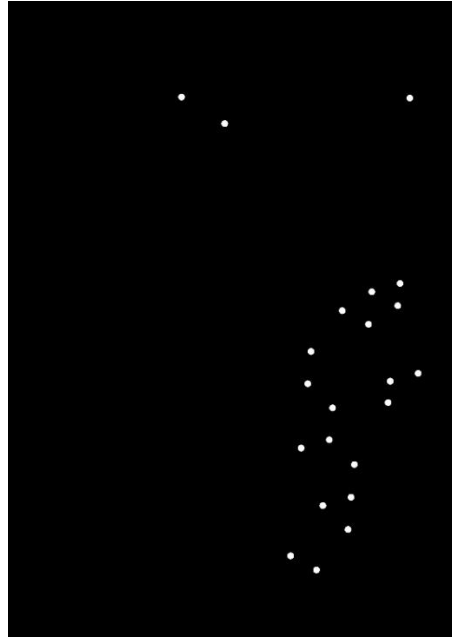
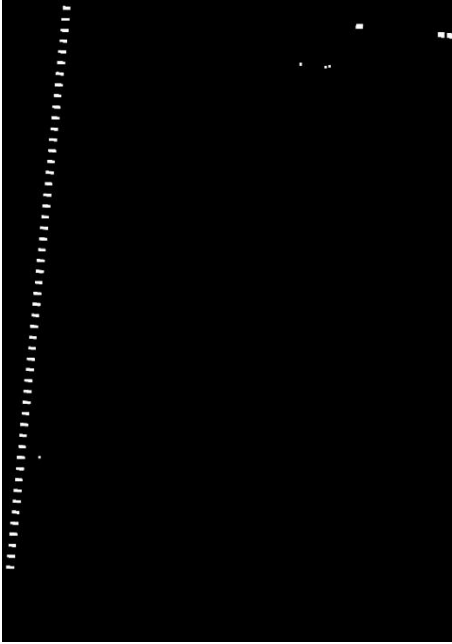
Circle



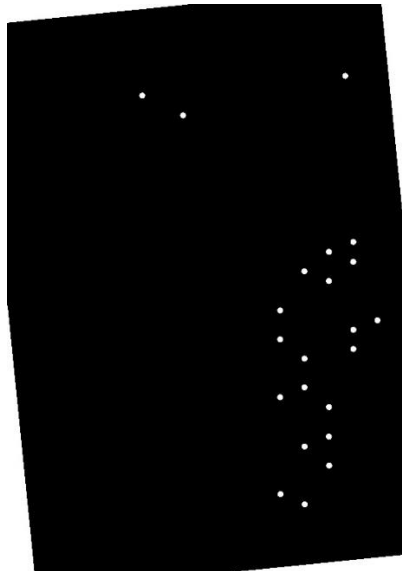
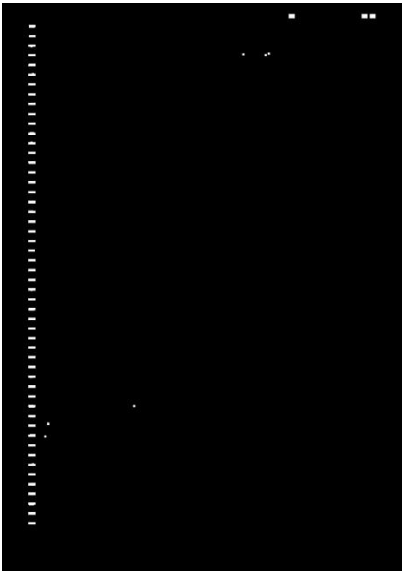
vertical squares



iversity of
horizontal squares



2. Then the program first guesses the orientation using the slope of the line passing through the vertical squares and rotates the original image by this angle. This is followed by repeating step 1 again on the original image after rotations.



3. The program then records the position of the centroid of each circle relative to the horizontal and vertical squares.

4. Now the program loops through all prerecorded relative position of possible questions and their possible answers and selects the most likely choices and outputs them.

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Q7: Strongly Disagree Requirements were clear.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
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