

Your Name: \_\_\_\_\_ Your T-Square ID: \_\_\_\_\_

- **You must show all work to receive full credit.** Correct answers with no work shown will receive minimal partial credit, while incorrect answers with correct work shown will receive generous partial credit. Illegible answers are wrong answers.
- **Integrity:** By taking this quiz, you pledge that this is your work and you have neither given nor received inappropriate help during the taking of this quiz in compliance with the Academic Honor Code of Georgia Tech.
- **Academic Misconduct:** Academic misconduct will not be tolerated. You are to uphold the honor and integrity bestowed upon you by the Georgia Institute of Technology.
  - Keep your eyes on your own paper.
  - Do your best to prevent anyone else from seeing your work.
  - Do NOT communicate with anyone other than a proctor for ANY reason in ANY language in ANY manner.
  - Do NOT share ANYTHING during the quiz. (This includes no sharing of pencils, paper, erasers or calculators).
  - Do not use notes or books, etc during the quiz.

Problem	Points	Lost	Gained	Running Total	Grader
1	5				
2	5				
3	5				
4	3				
5	5				
6	3				
7	5				
8	3				
9	6				
<b>Total:</b>	<b>40</b>				

1. (5 points) When seam carving an image, you need to start with an “energy function”. Describe what a good energy function does, and how it is used by the seam carving algorithm.
  
  
  
  
  
  
  
  
  
  
2. (5 points) What are the attributes that detected features (as detected in an image by a feature detector) should have to make them useful?
  
  
  
  
  
  
  
  
  
  
3. (5 points) When transforming image points using a  $3 \times 3$  transformation matrix, the matrix has three unique “regions”. For each of the (A, B, C) regions below, describe the transform (or transforms) that particular region encodes.

A	A	B
A	A	B
C	C	1



7. (5 points) What is the epipolar constraint, and what applications does it have with respect to stereo vision?
  
8. (3 points) Explain how a video is stored in computer memory when working on it with python code using the OpenCV library. (Specifically, what is different from the way a single image is stored in memory?)
  
9. (6 points) Given the following synthetic output from an “energy function”, calculate the intermediate result as the first part of a (vertical) seam carving dynamic programming solution. **After you do this, identify and mark the seam from the bottom to the top of the “image” which has the lowest energy.**

1	2	1	2	1
1	1	1	1	2
2	0	2	2	0
2	2	2	1	2
