CG ECSE-4750 Computer Graphics Midterm, RPI, Thurs 2017-10-12

W Randolph Franklin, RPI — 2017-10-14 00:00

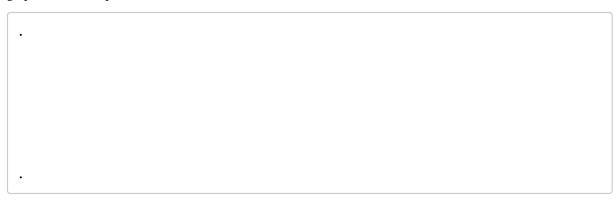
Name, RCSID:
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Rules:
1. You have 60 minutes.
2. You may bring in one 2-sided 8.5"x11" paper with notes.
3. You may not share material with each other during the exam.
4. No collaboration or communication (except with the staff) is allowed.
5. There are 18 questions. Check that your copy of this test has all the pages.
1. (4 pts) Suppose that we have a plane in 3-D thru the points A(4,2,0), B(2,2,0), and C(3,1,0).
1. What is its equation, in the form $ax+by+cz+d=0$?
2. Consider the line L thru the points $O(0,0,0)$ and $P(1,1,1)$. Where does this line intersect the plane?
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2. (2) Which RPI grad was the technical person in the founding group of NVidia?
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3. <i>(2)</i>	What hardware	component ha	ad to get much	cheaper in	order to	make frame	buffers possible?
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4. (5) Part of changing from one coordinate system to another is scaling and making things fit. E.g., suppose that you had a square with lower left corner (llc) (0,0) and upper right corner (urc) (2,2). You want to scale and center it to just fit into a rectangle with llc (0,0) and urc (2,4). Find s, d_x, d_y in these formulae:

$$x' = sx + d_x \ y' = sy + d_y$$

5. (2) Putting certain corkscrew-shaped mocucules in an electric field stretches them out. What widely used graphics device exploits this?



6. (2) Which of the following types of GLSL variables can be stored in constant memory in the GPU? uniform, varying, attribute.

•	
(2) If you do not tall OpenCI	to do hidden surface removal, and two objects overlap the same pixel, then
what color is that pixel?	to do midden surface removal, and two objects overlap the same pixel, then
what color is that pixel:	
1. OpenGL throws an erro	or.
2. the closer object	
3. the farther object	
4. the first object to be dr	awn there
5. the last object to be dra	
•	
•	
·	
(2) In 2D, what is the comple	ex number that corresponds to a rotation by 270 degrees?

erceptual coordinate system? You use it to determine what
dized API compared to a proprietary API?
0.7400001001
0.7488081981 \
0.1613101866

What's its determinant?

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(5) TC ($ heta$ is the angle of rotation, what's $\cos heta$?	
14. (<i>3)</i> 11 <i>0</i>	is the angle of rotation, what's COS U?	
•		
15. <i>(2)</i> Wh	nat does gl.bindBuffer do?	
•		
•		
16 <i>(2)</i> Wh	nat does gl.uniform1f do?	
(=) (1)	and do to grannyorming dot	
•		

17. (5) Many programs we've studied have a line like this:

var y = 2*(canvas.height-event.clientY)/canvas.height-1;

This is necessitated because of something messy in the various coordinate systems these programs use.

(2) What i	is GLSL used for?			
	total 50 points.			

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