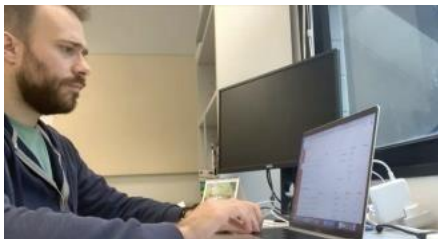# COMP4451 Exam on Canvas

Date and Time: Apr 21 (Thursday), 12:00pm – 1:20pm

(The exact schedule may be adjusted should any unforeseeable technical or nontechnical problems occur. Please pay attention to Canvas announcements as we will use that to announce any latest update if any technical issues arise.)

Coverage: All topics until (and including) "Sound".

Format: The exam consists of 20 questions, 10 being multiple-choice and 10 requiring typing in a (**usually** short) answer. The multiple choice questions may have one or more correct answers. You must mark all of the answers that apply to get credit for the question.

It is a 50-minute exam. Budgeting approximately 1 minute for each multiple choice question and up to 3 minutes for the written answer questions (which are mostly short) would still leave a buffer of 10 minutes. Once you answer a question, you may not return to it later.

Time	Activity
12:00pm	Log in Zoom with your ITSC account. Join your own exam Zoom meeting with your *mobile phone*, turn on your camera. **Exam room link:** Last name from A to LAU: https://hkust.zoom.us/j/98118467971?pwd=QTBIZVhNV2IwRUVWT2VVYVRuZGs4dz09 Last name from LAM to Z: https://hkust.zoom.us/j/95622582722?pwd=emtlNEhHZ0FQMkY3WDJWa2dYSUM5QT09 Your video in Zoom meeting should be similar as shown below: Have (1) your HKUST student ID or (2) your Hong Kong ID or your country's passport ready for checking. You can cover the ID number when showing it to the invigilator. Connect your mobile phone to power charger, make sure it won't run out of battery during the whole exam.

	You can leave your table once the TA finishes the camera setup checking. Keep your camera ON and at the same position until the end of exam.
	
	Note:
	    • Display your real name in Zoom meeting. No virtual background is allowed.
	    • Only one laptop/PC is allowed during the exam.
	    • The full computer screen should be visible in Zoom video.
	    • There is no strong reflection on the screen so Canvas 'red bar' is visible.
	    • Your both hands and keyboard are visible.
	    • No headphone or air pods.

12:20pm	Exam will be automatically released on COMP4451 Canvas → Quizzes.
	You have until 1:10pm to complete the exam.
	
	Note:
	    • You can only access a single Internet browser with single tab on Canvas during the exam. Access to other websites and programs on your computer is treated as attempt to plagiarism.
	    • No calculator and other electronic devices, No reference materials. Only draft paper is allowed.
	    • All your activities on Canvas and Zoom are recorded.

Advice on the use of Web browser for smooth access to Canvas during the exam:

1. Chrome or Firefox is preferred.
2. If you use Safari 13.1 on Mac, disable cross-site tracking or you might not be able to view images in questions.
3. Update your preferred Web browser to the latest version.
4. If you are having any other issues, you may try to clear the cache.

Update your Zoom to the latest version on your device BEFORE the exam.

Instructions for the setup of your two computing devices A and B

1.   **Device A:** a computer where you log onto our course Canvas and take the exam. You should not open any other programs on that computer, nor move your mouse away from Canvas at any time.
2.   **Device B:** join Zoom o with video ALWAYS ON, speaker ALWAYS ON, and microphone ALWAYS MUTED. No virtual background allowed.

Sample questions:

<u>Multiple choice:</u>
What is/are examples of a computation that is often performed in the fragment (pixel) shader?
   a) Multiplication by the model-view-projection matrix
   b) **Phong shading**
   c) Backface culling
   d) Depth testing

<u>Short:</u>
Q: In what stage of the rendering pipeline is backface culling executed?

A: Rasterization ("before Rasterization" also accepted)

<u>Longer:</u>
Q: Describe dead reckoning in 1-3 sentences.

A: A method that uses prediction to extrapolate the object position based on old position and velocity until new accurate update arrives.

Q: How do we modify a physics simulation in a game so that it attains framerate independence?

A: We perform a number of physical simulations proportional to the elapsed time since the last update while maintaining a constant simulation delta. For example, if 50 milliseconds have elapse, we perform 5 simulation steps with a delta of 10ms, while if 30 milliseconds have elapsed we perform 3 simulation steps also with a delta of 10ms.