CPSC 314
Computer Graphics

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Frames in Computer Graphics

Preliminaries

- Announcements
  - NEW: thanks to the efforts of Jennie (grad TA), we have provided typeset of notes that parallel handwritten in class notes. First set of notes posted on Canvas.
  - Reminder: Assignment 1 handin due 11:59PM 26th
  - Face-to-Face grading starts next week. Sign up coming soon
  - Quiz 1 on Friday 28th
    - online, but synchronous with class
  - Wednesday 26th class will be a review
  - Dinesh's office hour: Wednesdays 4:30-5:30pm (on Zoom)

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Quiz 1 Preparation

- Goal: understand the material covered in class so far
  (this forms the foundation for the rest of the course)
- CAREFULLY review ALL lectures before the quiz (including the review lecture).
- Textbook. Read all of these, except as noted. But use class notation
  - Ch 1
  - Ch 2: skip section 2.5
  - Ch 3
  - Ch. 4 (very short chapter, on “Respect”)
  - Ch. 5: skip 5.4 but use the in-class description of scene graph
- Quiz 1 will not have questions specifically about Assignment 1. However, there will be general questions about GLSL and Three.js. Doing and understanding the assignment will reinforce these concepts.

3

Quiz 1 mechanics

- Synchronous, during the class time, but ONLINE, on Canvas
- You MUST be present on Zoom with a video camera on at all times during the quiz. (Zoom link will be posted on Canvas)
  - Be prepared to show your ID to TA in a private breakout room
- Closed book, no Internet searches or communication
  - The quiz will have many small questions. Enough time to answer from memory. Searching for answers will waste your time (and isn’t allowed) so don’t try.
  - Be prepared to share your full screen at any time during the quiz. Close all other applications.
- Instructor and TAs will be available on Zoom to clarify questions

How to ask questions on Zoom

- Note: we can only answer questions to clarify whether there is an typo or ambiguity in a question.
  - We will not confirm whether your answer or interpretation is correct
  - If you feel some specific assumption is required, please state that in the answer
- The questions and answers are randomized. So you can't ask about "Question 2(b)" since that will be different for different students. Instead, cut and paste the question text in the chat window.

Quiz 1 guidelines

- Exam is for 50 minutes
- Budget 45 minutes for doing the quiz (One minute per mark)
- 3 Types of Question (Part A,B,C), each approx. 15 marks each part.
  - Part A: T/F questions
  - Part B: "Recognition" Fill in the blanks (with multiple choice).
  - Part C: "Computing" Solve a small problem, and select the correct answer. Usually involving 2D frames, transformations, etc. as we have been doing in class.
- We'll provide sample questions but not a full quiz

Today

- Review and answer questions about pre-recorded lecture L6 ("Getting to know transformations"
  - Anatomy of a transformation matrix
  - The lookAt matrix (Textbook Chapter 5.2.3, but see correction) https://threejs.org/docs/#api/en/core/Object3D.lookAt
  - Try the transforms app by Eric Haines available here: https://www.realtimerendering.com/udacity/transforms.html
- How Three.js Scene graphs lead to model and view matrices.
- The normalMatrix (Textbook 3.6)

Issues with Textbook's "lookAt"

- Book description in 5.2.3 has a bug, fixed in online Errata (make this and other corrections in your textbook copy)
  - z = normalize(p - q)
    x = normalize(u × z)
    y = (z × x)
- The book's "lookAt" should be called "eye" matrix (E in textbook, or camera C in our notes).
- It is the inverse of Three.js's camera.lookAt() method (which produces the view Matrix, V in our notes)
- The author is aware of these issues, will fix it in future editions

8

For next class

- Try the transforms app by Eric Haines that I showed in class, it's available here: https://www.realtimerendering.com/udacity/transforms.html
- Review