UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Engineering, Built Environment and Information Technology

Fakulteit Ingenieurswese, Bou-omgewing en Inligtingtegnologie / Lefapha la Boetšenere, Tikologo ya Kago le Theknolotši ya Tshedimošo

Department of Computer Science
Computer Graphics
COS 344

Class Test 3
03/05/2024

Instructions

1. This is an open-book event.
2. This is an individual assessment, and no group work will be allowed.
3. Answer all the questions.
4. Indicate any rough work clearly.
5. Upload a **PDF** with your answer to clickup before the deadline.
6. Please ensure your submission has the following settings:
   - Font size: 12pt
   - Font type: Arial
   - Minumum page margins: 1 cm
   - Maximum page count 3. Sketches will be excluded from the page count.
7. Please ensure your answers are typed.
8. The use of any AI chatbots is strictly forbidden.

Question:	1	Total
Points:	30	30
Score:		

Question 1 ..... (30 marks)

You need to render an unmanned ground vehicle (rover) that was sent on an exploration mission to an alien world similar to Mars. The planet contains a wide variety of species, similar to that of snakes and insects. The rover that you need to render, has two or more robotic arms that protrude out of the side of the rover with a set of tools at the end of the arms. Your rover should be able to swap between the tools. You also need to render the colourful insects and snakes, as well as the rough texture of the planet's surface using texture maps. Along with the main observation camera, the rover also has cameras in the blind spots, which can rotate. The rover is also able to move around in the terrain of the planet to while exploring and gathering data.

Discuss how you will approach the rendering of this scene, paying special attention to the following areas:

- Camera view.
- Robotic arm rendering and animation.
- Snake and insect shape rendering and animation.
- Snake and insect textures and details.
- Landscape shape rendering.
- Landscape textures and details.
- Also discuss the type of culling that you will perform, if any.

For each area discuss the available options, the benefits and drawbacks of each, and motivate your final choice of option(s). You may use more than one option to achieve the desired effect. You are allowed to motivate your explanations with annotated sketches.