CS488/688 - Winter 2022

Assignment 5

Due Date: *April 4, 2022, @8am.*

Objective:

Prepare a video (duration between 10s and 30s, with a frame rate of at least 24 frames per second and a minimum frame resolution of 500 x 500 pixels) depicting an animation produced using rendering techniques covered in the course, either employing an OpenGL (without interactivity) or a ray tracing framework.

General Procedures:

- The assignment should be done individually. The video frames should be generated using software developed by the student. Any breach of these guidelines will be considered a **violation of academic integrity**, and it will be dealt with according to the university procedures described in the course outline.

- For this assignment, students' creativity and resourcefulness are expected to take center stage. Accordingly, they should expect only high-level assistance from the course staff with respect to video production and/or recording. Video production tips will be provided through Piazza announcements.

- The students can select a tool of their preference to put the frames together in order to obtain the video file, which should be submitted in a **mp4** format.

- The evaluation of the submitted videos will have the following components: objective (6 marks), duration (1 mark), movement depiction (1 mark) and documentation (2 marks). In addition, students may obtain up to 3 bonus (subjective) marks.

- For the objective component, the submitted video must clearly and unambiguously depict 6 (one mark each) of the following 10 features:

    - texture mapping or bump mapping (both can be depicted in the video, but just one of them will count as one of the features),

    - reflection or refraction (both can be depicted in the video, but just one of them will count as one of the features),

    - shadows (yes, it counts as an objective even if it was done in A4)

    - two or more geometric primitives interacting with each other (*e.g.*, a ball bouncing on a plane) without space overlap,

    - participating media (*e.g.*, fog),

    - depth of field or motion blur (both can be depicted in the video, but just one of them will count as one of the features),

    - cel shading,

- particle systems, and

- sound (synchronized with action).

- Important notes for a student that chooses to use a ray tracing framework for their animation:

  - The student's extra objective from A4 should be mentioned in A5 documentation (described below), and it will not count as one of the required features for A5. If a student has implemented multiple extra objectives for A4, one may be selected as the "A4 extra objective" and any *additional* extra objective may be used as one of A5 features (assuming it is included in the list of A5 features provided above).

  - For A5 features where multiple options are presented (*e.g.*, texture mapping or bump mapping), neither one will count as a feature for A5 if one of them was the extra objective for A4 (unless it was one of the *additional* extra A4 objectives mentioned above).

- For the duration component, videos between 10s and 30s will get 1 mark. Time spent on stand still frames will **not** count for the required video duration.

- For the movement depiction component, videos depicting two or more distinct moving objects (not necessarily at the same time) will get 1 mark. The camera can be considered one of the objects. Although light source movement can be included in the animation, it will not be considered as one of the required moving objects.

- The documentation component will be evaluated in terms of completeness, clarity, references and presentation quality. Each of these criteria will receive a mark between 0 and 0.5, for a total of 2 marks.

- For the bonus component, aspects like originality, aesthetic appeal and polishing will be considered. Due to the subjective nature of this component, no breakdown will be provided.

- **The evaluation criteria for this assignment will not be discussed via email or Piazza.** Thus, no messages or other information related to the marking of this assignment should be posted in Piazza (general posts along these lines will be removed). Students that have questions about these criteria should contact the instructor during his office hours.

- Questions about the submission instructions (provided below) should be directed to the course TAs using their email addresses or private Piazza posts. If the answers may require more detailed explanations (more than one or two lines), they will ask the student to contact them during their office hours.

- Students that have questions about the scope of this special assignment whose answers cannot be found in its document, should contact the instructor via email using the address `gvgbaran@gmail.com` with the subject "CS488/688: A5 Question". If the answers may involve more detailed explanations (more than one or two lines), the instructor will ask the student to contact him during his office hours.

- **The marks for this assignment will be posted on Learn on April 8, or later in case of unforeseen technical difficulties.** Students will receive a mark between 0 and 10 (plus additional bonus marks if appropriate), which, like in previous terms, will be final. Due to the subjective nature of the bonus marks, their breakdown will not be disclosed.

Submission Instructions:

- The video (duration between 10s and 30s, with a frame rate of at least 24 frames per second) should be submitted (**mp4** format) using the A5 dropbox on Learn. Videos submitted in a different format will not be accepted, and the student will receive **ZERO** marks in A5.

- The video file should be identified using the student's last name followed by the last three digits of her/his ID (*e.g.,* Pele-010.mp4).

- Students should also submit a pdf document (fontsize 12pt and a maximum of four pages) including a brief description of their video (which of the aforementioned 10 features were implemented), a concise outline of the techniques (with supporting references) and tools used to produce it, and the sources of the employed assets (*e.g.*, texture maps, bump maps, geometrical meshes, soundtrack ...). Students should clearly state which of these assets were created by themselves or obtained from a third party. In the latter case, the third party should be clearly acknowledged. The references, which should include peer-reviewed materials, have to be listed in a bibliography section and be connected to the text (*e.g.*, check references in the supplemental information files provided during the term).

- The pdf document should also be submitted via Learn (also using the A5 dropbox) and identified using the student's last name followed by the last three digits of her/his ID. The student's name and ID should be also provided at the top of the pdf document.

- Video and documentation (pdf document) submissions that do not follow these identification instructions will result in a **-2 penalty** in the student's A5 mark.

- Students should submit these materials in separate files, *i.e.,* **zip** files should **not** be used. Otherwise, there will be a **-2 penalty** in the student's A5 mark.

- As in the previous assignments this term, students are also required to submit a signed declaration. The declaration template can be retrieved from the course website alongside this document. An assignment submitted without a signed declaration will receive **ZERO** marks.