CS606: Computer Graphics
Evaluation Booklet *

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Term II (2018-19)

1 Important Dates

- Assignment 0 (A0) submission: 11:59:59 pm (IST) Jan-13-2019 (Sunday)
- Assignment 1 (A1) submission: 11:59:59 pm (IST) Jan-27-2019 (Sunday)
- Assignment 2 (A2) submission: 11:59:59 pm (IST) Feb-17-2019 (Sunday)
- Reading-Writing-Presenting Assignment (RWPA) – report submission: 11:59:59 pm (IST) Mar-24-2019 (Sunday)
- Assignment 3 submission: 11:59:59 pm (IST) Mar-31-2019 (Sunday) [If A3 and A4 are combined, then this would be an interim review deadline.]
- Assignment 4 submission: 11:59:59 pm (IST) Apr-28-2019 (Sunday)
- RWPA report+presentation submission: 11:59:59 pm (IST) Apr-28-2019 (Sunday)
- Midterm: March 02–09, 2019
- Finals: May-06–11, 2019
- Hard deadline for all submissions: 11:59:59 pm (IST) May-12-2019 (Sunday)

2 Assignments

The course handbook provides details of scope of assignments, submission rules, and implementation rules.

DETAILS OF EXPECTED OUTCOMES:

- Assignment 1 [A1]: Developing GUI for rendering, translation, scaling
- Assignment 2 [A2]: Developing 3D interactive applications – rotation using quaternions, mesh rendering with basic lighting; using MVC design pattern for software development
- Assignment 3 [A3]: Learning mesh parametrization with texture mapping, and lighting; fine-tuning MVC design pattern in software development
- Assignment 4 [A4]: Learning animation of a hierarchical model and a virtual reality application [This assignment will heavily re-use the code written for A3].

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ASSIGNMENT 0: INTRODUCTIONS

Grading:

This assignment will not be graded.

Submission:

A single .pdf file named as <RollNumber>_A0.pdf, to be submitted on LMS.

Description:

Submit a 100-200 words professional essay, not exceeding a page, in a .pdf file format. The essay should focus on the following details:

1. Name, professional background (education and work experience), stream chosen at IIITB.
2. A priori knowledge and practice of computer graphics, gained from related courses, or projects.
3. The expected outcome of this course in terms of knowledge and skills.

ASSIGNMENTS 1-4: Programming

Grading:

A1 and A3: Each assignment will be worth 10% of final grade – 5% for demo; 5% for code-review
A2 and A4: Each assignment will be worth 20% of final grade – 5% for demo; 15% for code-review

Submission:

A single zipped folder of all the constituent files, as described in the Course Handbook.

Description of Assignment 1: 2D Rendering

Create a 2D graphical application for rendering a touch-screen calculator as shown in Figure 1 (leftmost).

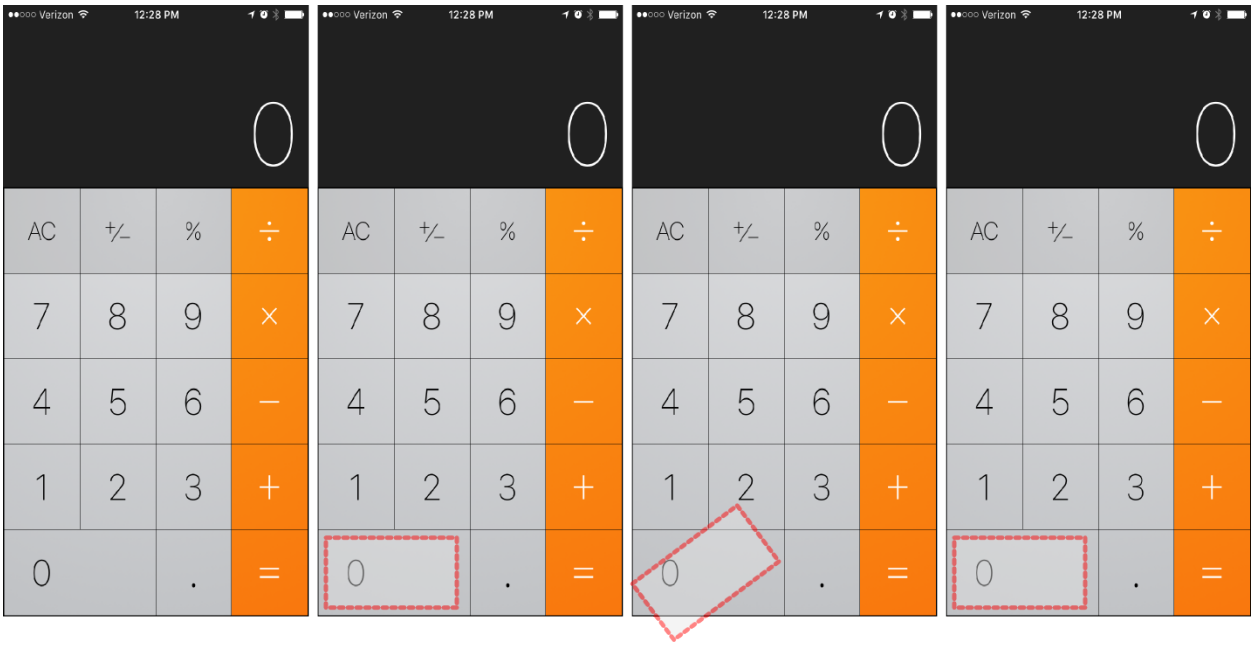

Figure 1: (Leftmost) A calculator application on iPhone. (left-to-right) On clicking the number "0", an overlay (a red rectangle) appears on the "0" key, and it rotates from -45° to 45°, and back to 0°.

1. The keys and output text box must be modeled using rectangles, as shown in Figure 1. Build a 2-dimensional geometric model for the keys and text box.
2. It is not necessary to write text using OpenGL, however when a key is pressed, its corresponding number or operator is outputted as text in the console. The box for a number key can be colored with a specific color (e.g. light gray in Figure 1), and operators can be colored in a different color.
3. Figure 1 shows the animation of a widget upon pressing the left mouse button "down" anywhere in its corresponding rectangular box. The red overlay box must be a scaled down duplicate of the selected key, as shown in the Figure.
4. Use keyboard keys, e.g. "m" or "M" to translate the calculator.
5. Use keyboard keys, e.g. "r" or "R" to rotate the calculator (this is different from rotating each key when pressing a key).

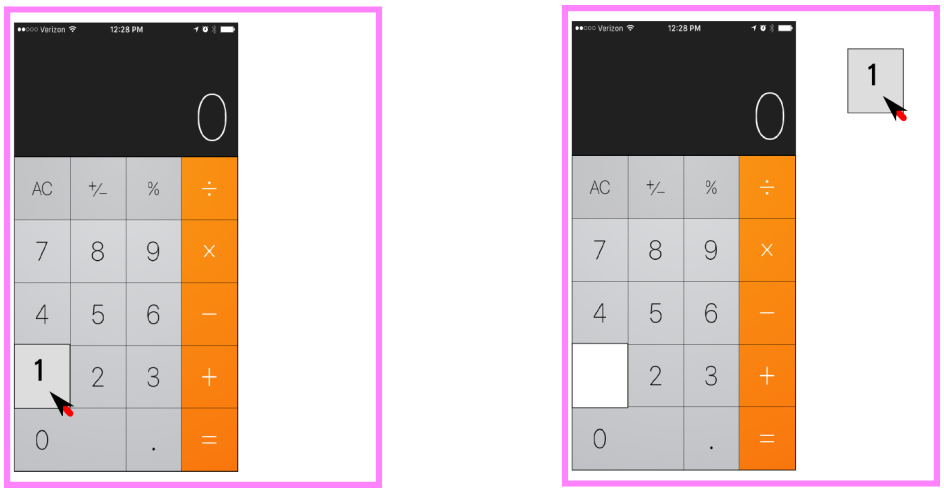

Figure 2: (Left-to-right) Moving the key "1" on the calculator app.

6. Use keyboard keys "+" and "-" to zoom in and out, respectively.
7. Generate a new action of pressing and dragging the right mouse button for moving a key using pick-point action, as shown in Figure 2.

Questions to be answered in the report:

1. How is rotating each key different from rotating the entire calculator?
2. How does picking the point work? Suppose we zoom in, and rotate the calculator by 90°, the pick-point action must still work correctly, i.e., the zoomed-in and rotated key must be moved in the expected orientation. How can pick-point action accommodate these prior transformations?

Description of Assignment 2: 3D Rendering Using MVC Architecture

Details to come soon!

Description of Assignment 3: Lighting and Camera Models+Texture Mapping+Refining MVC

Details to come soon!

Description of Assignment 4: Scenegraph+Animation

Details to come soon!

RWPA: Reading-Writing-Presenting Assignment

Grading:

RWPA: The assignment is worth 10% of final grade – 5% for report; 5% for presentation.

Submission:

A single .pdf for report submission, and zipped folder of presentation and report for final RWPA submission (after class presentation).

List of Papers:

To be decided.

3 Examinations

- Midterm: 15% of final grade: Closed book 3-hour written examination
- Finals: 15% of final grade: Closed book 3-hour written examination