CS211

Milestone #1

Due: April 6, 2020

You must submit a repository with two separate project folders, one for `InteractiveProjection` and one for `Game` as explained below, by **the 6th of April, before 23:55**. This milestone will be graded based on the items listed below.

Code Submission

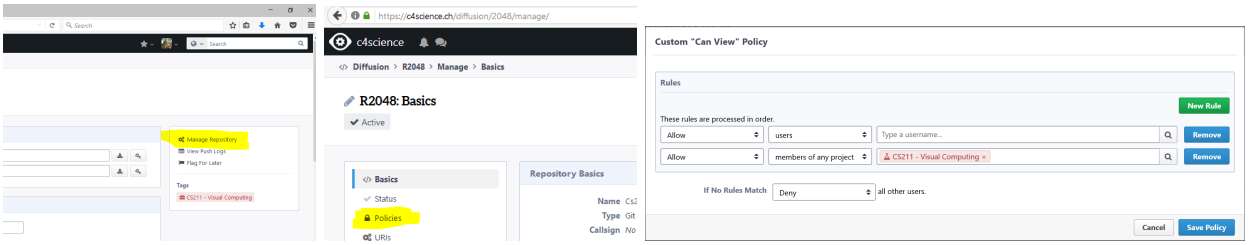
The two projects `InteractiveProjection` and `Game` must be in the same c4science repository, under different directories. If you work with other Java IDEs, copy and paste your code in Processing, and make sure that it runs in the Processing development environment.

When your code is ready for submission, **tag your git repository** with the tag `milestone1_submit`:

```
$ git tag milestone1_submit
$ git push --tags
```

(if you made a mistake, re-tag your repository as desired with `git tag -f milestone1_submit` and 'force' push it: `git push -f --tags`)

Then, submit the public URL of the repository on Moodle (under *Milestone 1*). **Make sure that we have the right to clone it!** To do so, in all your policy settings (visible, editable, push), define a custom policy and add bb_bruno (Barbara Bruno) and members of project "CS211 - Visual Computing".



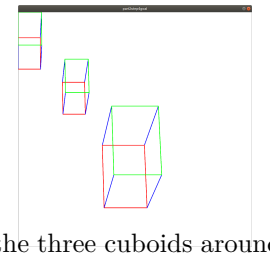
Note

Even though the project is to be done in group and you will receive one single grade per team, **it is important that every team member contributes in every part of the project**. We remind you that the final written exam will include questions related to topics that are dealt with during the project only.

Milestone 1 - Checklist

InteractiveProjection project - that includes InteractiveProjection.pde

- `InteractiveProjection.pde` implements the rotate, scale, and translate transformations as well as the projections in P2D rendering mode and using matrix multiplications (**NO use of Processing built-in transformation functions is allowed**).
- When running the sketch `InteractiveProjection.pde`, it should display 3 cubes on the screen, with each of the rotate, scale, and translate transformations clearly visible (last part of week #2).



- ↑ and ↓ keys must rotate each of the three cuboids around its own X axis (first part of week #3).
- ← and → keys must rotate each of the three cuboids around its own Y axis (first part of week #3).

Game Project - that includes Game.pde

- `Game.pde` displays a 3D 'board' at the center of the screen, with a ball (3D sphere) on it.
- Mouse drag tilts the board around the X and Z axes, up to +/- 60° (refer to *Week 4 - Goal Video* to make sure your board moves around the correct axes, also see the figure at the end of Week #3).
- Mouse wheel increases/decreases the tilt motion speed. Speed should have suitable limits to allow playability.
- When the board is tilted, the ball moves according to the gravity and friction (gravity points toward +Y).
- By pressing ⇧, a top view of the board is displayed (*object placement mode*). In this mode, a click on the board surface places the opponent particles emitter at the click's location. It should not be possible to place the emitter outside of the boundaries of the board. It must be possible to enter this mode multiple times during the game.
- The villain has the appearance of the robotnik given in Assignment # 6.
- The opponent remains on the board when ⇧ is released, and moves with the board when it is tilted with the mouse.
- The opponent emits particles at a given frequency based on the frame count.
- The emitted cylinders neither collide with each other nor with the ball, and appear on the board only.
- The ball collides with the cylinders and board's edges. The correct collision distance is computed.
- When colliding with a cylinder or hitting the edges of the board, the ball makes a realistic bounce (by realistic we mean: correct bounce direction).
- When the ball collides with a cylinder, this cylinder disappears.
- When the ball collides with the emitter, all cylinders disappear.

To evaluate the above points, the TAs will first of all play your game. Make sure all the settings (ball speed, board tilting, etc.) allow for **a smooth and easy user experience**!