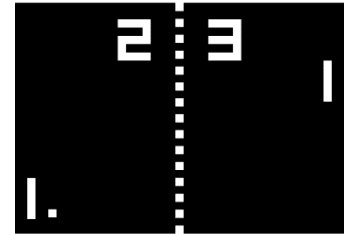


2019/2020, 4th quarter

## INFOGR: Graphics

# Practical RETAKE: Game in a Shader

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### The assignment:

The short story: write a Pong-game in a post-processing shader.

In P3 you may already have worked on a post processing shader, e.g. for vignetting or depth of field. Although we normally use a post processing shader to slightly modify an existing image, we can also take it further. It is even possible to write a full game, (almost) completely in the shader. Details will follow, but first: formalities.

The following rules for submission apply:

- Your code must compile and run 'out-of-the-box' (exception: we will restore packages if necessary). You can reduce the risk that your code fails during assessment by testing it on someone else's machine.
- Make sure you clean your solution before submitting (i.e. remove all the compiled files and intermediate output). This can easily be achieved by running clean.bat (included with the template). This will also kill the OpenTK package. Contrary to popular belief, this is OK as it significantly reduces the zipped size, which we like.
- Include a readme. The readme should provide the names and student numbers of the authors, a statement on the work division, an overview of the implemented features, any instructions we may need to operate the program and finally, an accurate and complete overview of sources used in the creation of your program.
- You can work alone (without penalty) or with a single partner on this project.

### Grading:

If you produce a working game-in-a-shader, you get a 6. Implement additional features to obtain additional points (up to a 10). From the base grade of 6, we deduct points for a solution that was not cleaned, a solution that does not compile, or a solution that crashes (1 point for each problem).

The retake grade replaces your **P1** or **P2** grade (we will pick the option that yields the best final result).

### Deliverables:

A ZIP-file containing the contents of your (cleaned) solution directory, and the readme (in .txt file format). The contents of the solution directory should contain your solution files (.sln, .vcxproj), all your source code and all your asset files (including shaders, models and textures).

Send your submission by e-mail to [bikker.j@gmail.com](mailto:bikker.j@gmail.com).

**Deadline:**

**Friday, July 10, 2020, 11:59h (NOON!)**

This is a hard deadline, and there is no late or very late deadline. Any materials handed in after the deadline will not be graded. Your grade must be final at the end of that afternoon.

**High-level Outline**

For this assignment you will build a small game that handles all its rendering in a single shader that is applied to a full-screen quad (so, just like the post processing shaders). 'All its rendering' means: visualizing the pads and the ball, as well as any other elements you may require, such as score digits and playfield boundaries. It also means that there are no OpenGL commands that produce output, except for the commands that draw the full-screen quad. And finally, for clarity, it means that your 'post processing shader' is executed on a black image (or: overwrites whatever is there).

Some parts of your game still need to run on the CPU side. The GPU has no access to your mouse or keyboard, so that needs to happen in C# code. The GPU also cannot update uniforms from shader code, so keeping track of the ball position is best handled on the CPU.

**Template**

Please use the P2 template for the retake assignment.

**A Bit Extra**

Meeting the minimum requirements earns you a 6 (assuming practical details are all in order). An additional four points can be earned by implementing optional features. An incomplete list of options, with an indication of the difficulty level:

- [EASY] Give the ball a trail. (0.5 pt)
- [EASY] Draw score digits. (0.5 pt)
- [EASY] Add a VHS tape simulation in a post process (0.5 pt)
- [EASY] Add a random bonus on the field that spawns a second ball. (0.5 pt)
- [.....] Add other creative things to the game.

**Important:** Extra features do not score points if the minimum requirements are not met.

**And Finally...**

Don't forget to have fun; make something beautiful!

May the Light be with you,

- Jacco.