

Game Name: Prisoner of Time

Github Link: <https://github.com/MGJamJam/cgue21-PrisonerOfTime>

Team Members: Palumbo Antonio (01624251), Gantner Myriam (11778900)

Goal: Survive 90 seconds by dodging obstacles and collect at least 3 TimeRelics by searching them in the woods to win the game.

Description of Implementation:

Player movement:

- Press key SPACE to Jump
- Press key A to move the player to the left lane
- Press key D to move the player to the right lane
- When the time swap is activated the A and D keys are swapped – so when going backwards, A triggers movement to the right and D movement to the left.
- When in the TimeRelic mode W is for forward movement, S for backward movement, A for left movement, D for right movement and SPACE for jumping

Other controls:

- press F1 to toggle wireframe mode
- press F2 to toggle culling
- press F3 to toggle the HUD
- press ESC to exit the game
- Press Up to increase brightness
- Press Down to decrease brightness
- Press O to increase refresh rate
- Press L to decrease refresh rate
- Press F to toggle between fullscreen and no fullscreen
- Press T to enter timeRelic mode when the Text “TIMERELIC – Press T” appears on the screen

Camera:

- The camera is fixed on the player. By scrolling the mouse wheel you can zoom in and out a little bit.

Features of the game:

- 3D geometry loaded with assimp: Trees, TimeRelics, Stones and Character model
- HUD: 2D overlay during the game, showing the remaining time, the collected TimeRelics and the FPS
- GPU vertex Skinning
- CPU Particle System using instancing surrounding the player and the TimeRelics
- Text Rendering with FreeType
- Collision Detection is implemented with simple bounding boxes that check for collision of the player with the TimeRelics/Obstacles
- Objects are illuminated by a directional light. The path and the terrain have textures. All objects have a material.

Known Bugs:

It happens rarely that a Generic Error is thrown when starting the game. We couldn't find the source of the problem, however it started after implementing the particle system. Closing and restarting the game solves the issue.

Additional Libraries:

- glfw
- freetype
- SDL2
- assimp
- stb
- glad
- glm

Used Links/Tutorials:

Camera:

<https://learnopengl.com/Getting-started/Camera>

<https://www.youtube.com/watch?v=PoxDDZmctnU>

Shader:

<https://learnopengl.com/Getting-started/Shader>

Player Movement:

<https://answers.unity.com/questions/1528714/jump-not-framerate-independent.html>

[https://www.youtube.com/watch?v=d-](https://www.youtube.com/watch?v=d-kuzyCkjoQ&list=RDCMUcUkRj4qoT1bsWpE_C8lZYyoQ&index=4)

[kuzyCkjoQ&list=RDCMUcUkRj4qoT1bsWpE_C8lZYyoQ&index=4](https://www.youtube.com/watch?v=d-kuzyCkjoQ&list=RDCMUcUkRj4qoT1bsWpE_C8lZYyoQ&index=4)

Assimp & Model Loading:

<https://learnopengl.com/Model-Loading/Assimp>

<https://ogldev.org/www/tutorial22/tutorial22.html>

<https://www.youtube.com/watch?v=V1EwCHHxFUs>

Blender Modelling:

[https://www.youtube.com/watch?](https://www.youtube.com/watch?v=DiIoWrOlIRw&list=PLFt_AvWsXl0fEx02iXR8uhDsVGhmM9Pse)

[v=DiIoWrOlIRw&list=PLFt_AvWsXl0fEx02iXR8uhDsVGhmM9Pse](https://www.youtube.com/watch?v=DiIoWrOlIRw&list=PLFt_AvWsXl0fEx02iXR8uhDsVGhmM9Pse)

Skeletal Animation:

<https://ogldev.org/www/tutorial38/tutorial38.html>

<https://github.com/FakeTruth/SkeletalAnimation>

<https://www.youtube.com/watch?v=f3Cr8Yx3GGA>

<https://learnopengl.com/Guest-Articles/2020/Skeletal-Animation>

<https://www.gamedev.net/forums/topic/688121-skeletal-animation-assimp-glm-and-me-in-between33/>

Particle System:

<http://www.opengl-tutorial.org/intermediate-tutorials/billboards-particles/particles-instancing/>

https://github.com/opengl-tutorials/ogl/tree/master/tutorial18_billboards_and_particles

<https://learnopengl.com/In-Practice/2D-Game/Particles>

<https://levelup.gitconnected.com/how-to-create-instanced-particles-in-opengl-24cb089911e2>

[https://www.youtube.com/watch?](https://www.youtube.com/watch?v=6PkjU9LaDTQ&list=PLRIWtICgwaX0u7Rf9zkZhLoLuZVfUksDP&index=35)

[v=6PkjU9LaDTQ&list=PLRIWtICgwaX0u7Rf9zkZhLoLuZVfUksDP&index=35](https://www.youtube.com/watch?v=6PkjU9LaDTQ&list=PLRIWtICgwaX0u7Rf9zkZhLoLuZVfUksDP&index=35)

HUD:

<https://learnopengl.com/In-Practice/2D-Game/Render-text>

Text Rendering:

<https://learnopengl.com/In-Practice/Text-Rendering>

Textures:

<https://www.cg.tuwien.ac.at/courses/Textures/>