

# VISUAL COMPUTING



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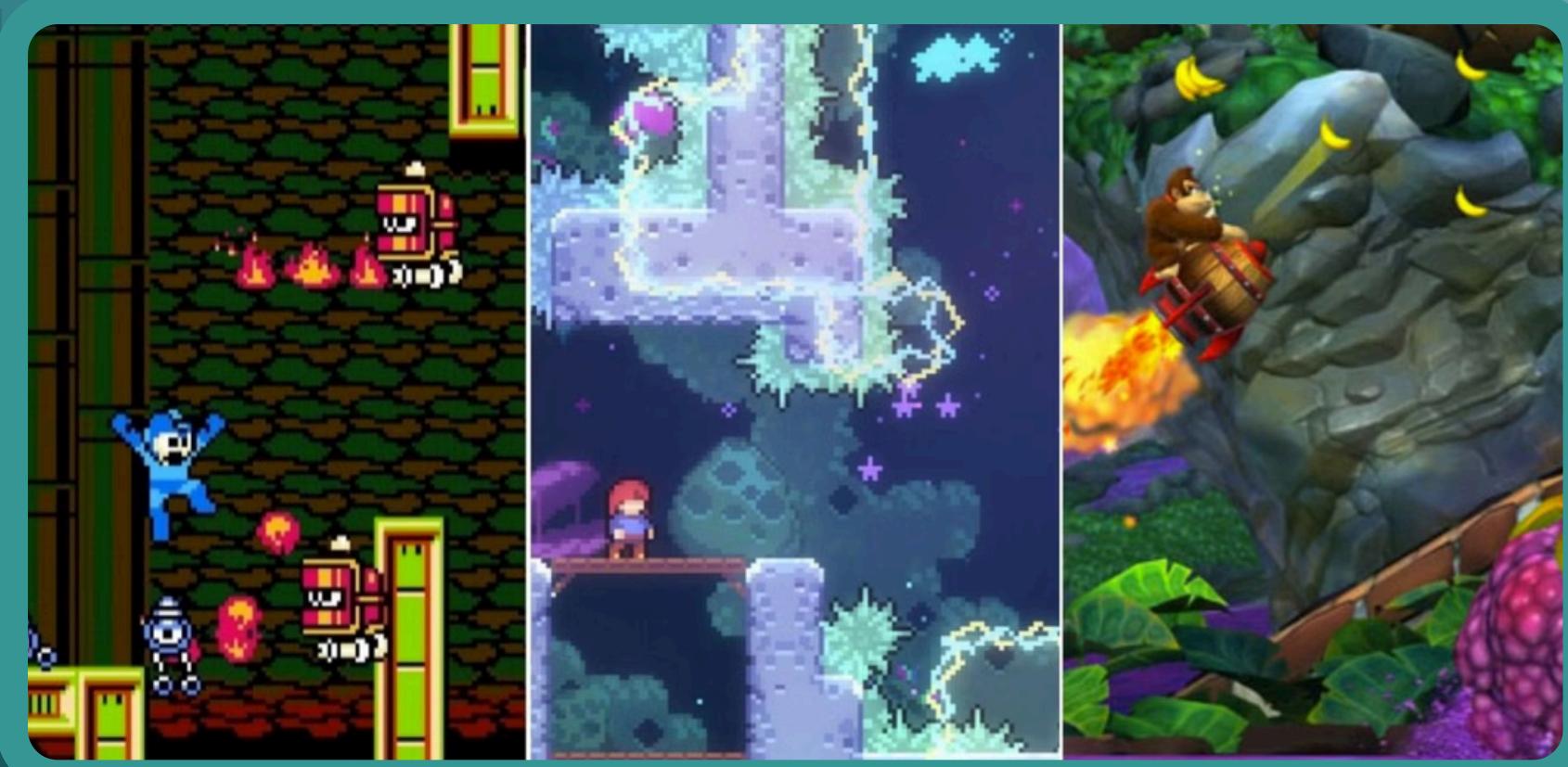
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# MOTIVATION CONCEPT

- Interest in the gaming field but 0 experience yet.
- We grew up playing 2D platformers
- We wanted a game idea that would let us explore various visual computing concepts without being limited to just one.



# OVERALL IDEA<sup>2D</sup>

Play as a wizard who bends reality using magical transformations  
(in this case related with CV topics)

Main Mechanics:

- Flip between 2D and 3D worlds
- Control certain objects by rotating, zooming and scaling them



# TOOLS USED

(for assets)



GOBOT



# ASSET DEVELOPED



# GAME

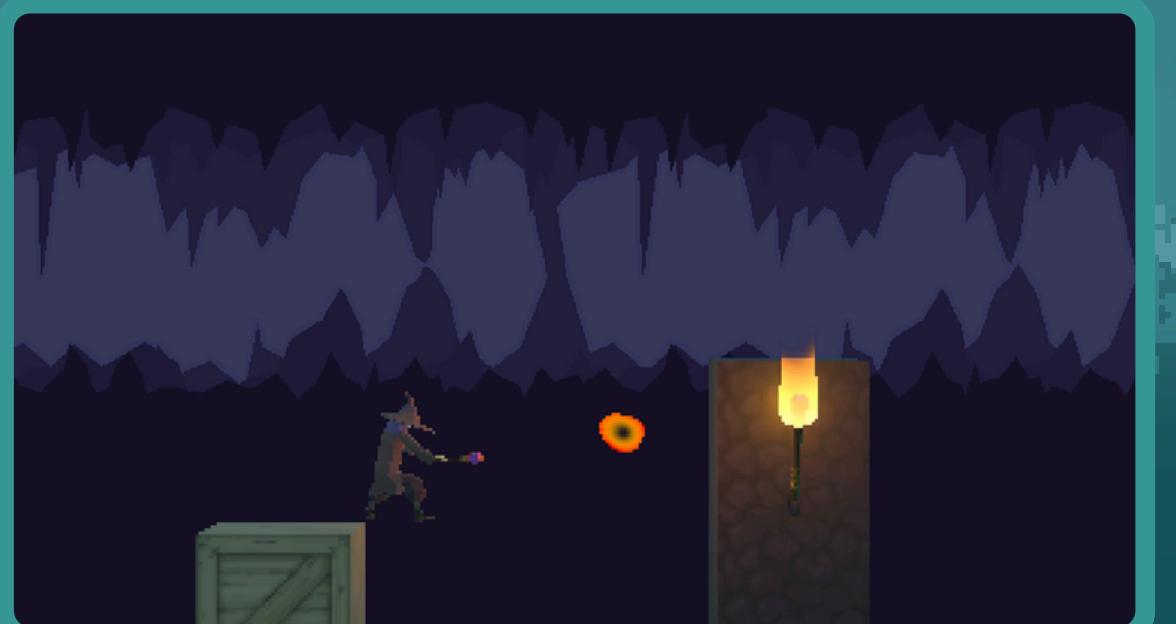
1 - Magic Forest



2 - Magic Forest 2



3 - Dark Cave



# LEVELS

4 - Space Discovery



BUT BEFORE THE LEVELS...

## LEVEL SELECT MENU

- Pixelated Melting and Fade Effect Shader



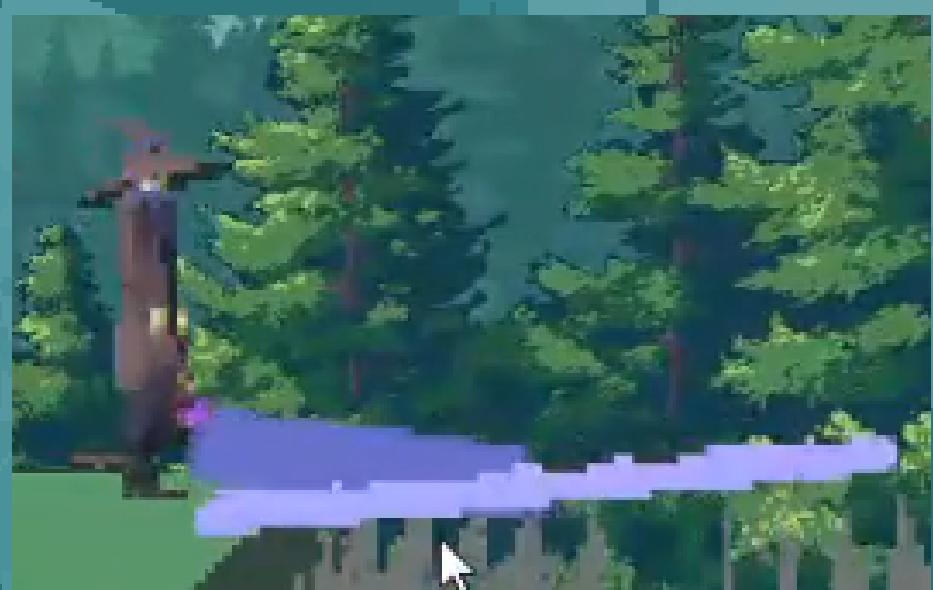
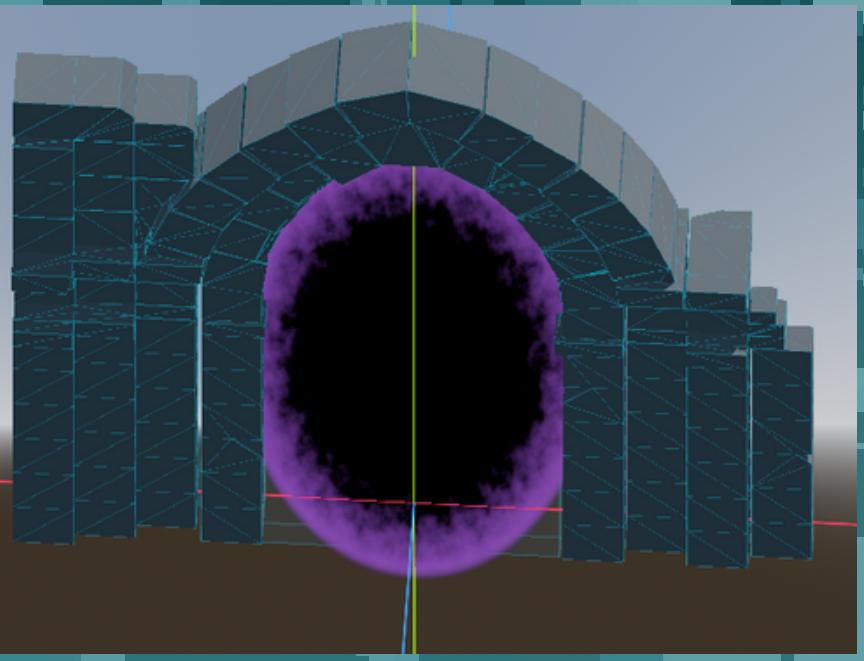
# GENERAL CV CONCEPTS APPLIED IN A GAME



- Camera movement
- Multi-Projection Camera System:
  - Seamless transition between 2D orthogonal, 2D perspective and 3D projection
- Parallax and Sky boxes for environment settings
- Pixel Art Post Processing effect

# GAME GENERAL CV CONCEPTS APPLIED

- Portal: UV Coordinate distortion using continuous noise textures.
- Respawn: Alpha erosion using gradient mapping (death\_shader).
- Edge detection shader to create an outline effect (post processing)
- Ray particle beam
- Glow emission objects



# LEVEL 1

- Get familiar with character movement.
- Introduce the 2D to 3D mechanic to pass by obstacles.
- Introduces 2D orthogonal to perspective and object manipulation

## INTRODUCES THE FOLLOWING CV CONCEPTS

- Perlin Noise to generate vegetation
- Turn on perspective camera to allow to make objects bigger when applying a translation to the camera.
- Different projections



# LEVEL 2

More complex puzzles around object manipulation.

## INTRODUCES THE FOLLOWING CV CONCEPTS

- Scale boxes in order to reach higher ground
- Move a box above other in order to create a stair and reach higher ground
- Scale and rotate the wooden board in order to avoid the spines



# LEVEL 3

Cast fireballs to hit torches and light them up in order to illuminate the cave and unlock the portal to complete the level.

## INTRODUCES THE FOLLOWING CV CONCEPTS

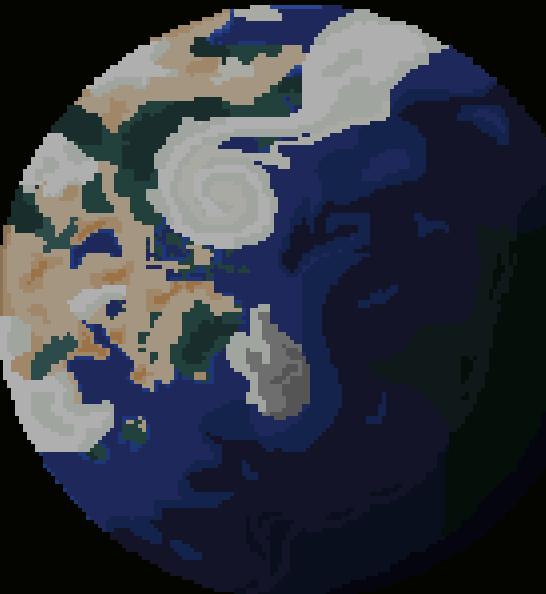
- Complex shaders:
  - Fireball
  - Torch fire
  - Fire light vibration
- Illumination (OmniLight3D):
  - Fireball progressive cave illumination on movement
  - Torch Fire illuminates nearby area





# LEVEL 4

**Control light projection in order to reveal hidden platforms in the wizard path.**



**INTRODUCES THE FOLLOWING CV CONCEPTS:**

**Real-Time Lighting Calculations:**

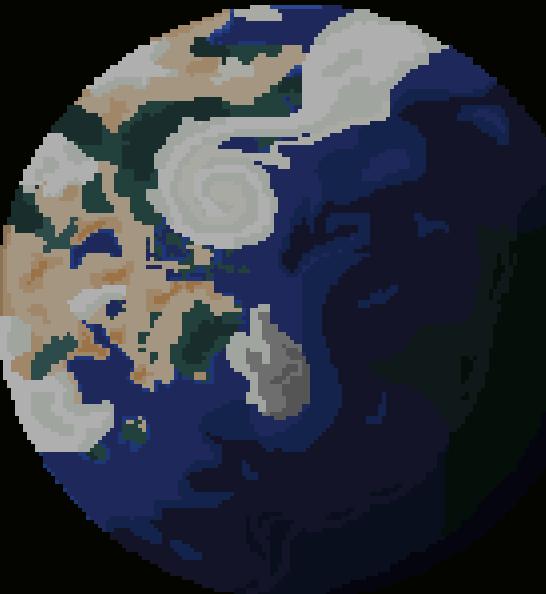
- Custom Fragment Shader implementation of Spotlight attenuation.**

**0 Gravity**



# PROBLEMS DURING THE DEVELOPMENT

- Drawing everything on a scene using a script
- By making our game level based, the development and exploration of different concepts was slowed down due to creating the level environments.



# GOALS REVIEW

1. Implement shaders to create a pixel art style out of 3D models
2. Have 3-4 levels each introducing a new mechanics
3. Create good documentation
4. Good usability practices and most importantly, try and make a fun game :)



# FUTURE WORK

- MISSING LEVEL



- IMPROVE SOME CAMERA BUGS
- IMPROVE WAND CONTROL BUGS
- O GRAVITY ON OTHER THINGS BESIDE THE SMALL ISLANDS

MANAGE PRISMS IN ORDER TO MAKE THE LIGHT BEAM TO REACH THE DOOR AND UNLOCK IT



**Thank you for  
your attention!**

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