Portal 2D

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Systèmes Embarqués Microprogrammés

NDS features: checklist (1/2)

- **ARM Processors**
  - describe what you use the ARM9 (and optionally the ARM7) for
  - We used the ARM9 for the interaction of the player with buttons and doors (A key) as well as for launching portals (L/R keys) and movement of the player (4 dir keys). We decided to use the LCD screen (using VRAM A for backgrounds and VRAM B for sprites) for showing the levels and left the touchscreen for aiming with the portal gun (ARM7). It was also used in order to start the game and reset a level (start).
  - On the other side, the ARM7 was used for aiming with the touchscreen (VRAM C) as said above, to play sound for audio feedback and to play the game's music.

- **Timers / Interrupts**
  - describe how you use the timers and interrupts in your project
  - In order to manage interactions of the player, we used interrupts to detect actions (A key, start to start the game). We used timers to add challenge to the levels as the player has to get to the door in a limited time after pressing a button and an interrupt to manage the timer. We also added a VBLANK interrupt to update the player and sprites only when necessary.

NDS features: checklist (1/2)

- **Graphics**
  - describe how you use the main/sub screen in the project
  - On the main screen, we show the levels and the player interacting with it and with portals. For that reason, we chose to use a background in Tile mode in order to ease the process of checking tile types, on which player interaction depends (wall, ground, forbidden or not for portals, button, door, …). We also used another background which is only decorative in Tile mode.
  - On the sub which is the touchscreen, we show the portal gun angle for a better aiming accuracy. We used extended rotoscale mode in order to rotate the portal gun to help visualize the angle.
  - At the beginning of the game and at the end, we use both screen for instructions and messages as well as illustrations.

NDS features: checklist (1/2)

- **Keypad**
  - describe how you use the keypad in the project
  - We used the directional pads for player movement (move left/right, jump) and slowing time in the air (down key).
  - We used L/R for launching portals and A for interactions with buttons and doors.
  - Start was used for starting the game and for level reset.

NDS features: checklist (2/2)

- **Touchscreen**
  - describe how you use the touchscreen features in the project
  - We used the touchscreen in order to allow more accurate aiming with the portal gun via touching the screen at the right angle to rotate the portal gun representing the aiming angle so that the player can choose where to try to launch a portal. It also updates the player orientation accordingly.

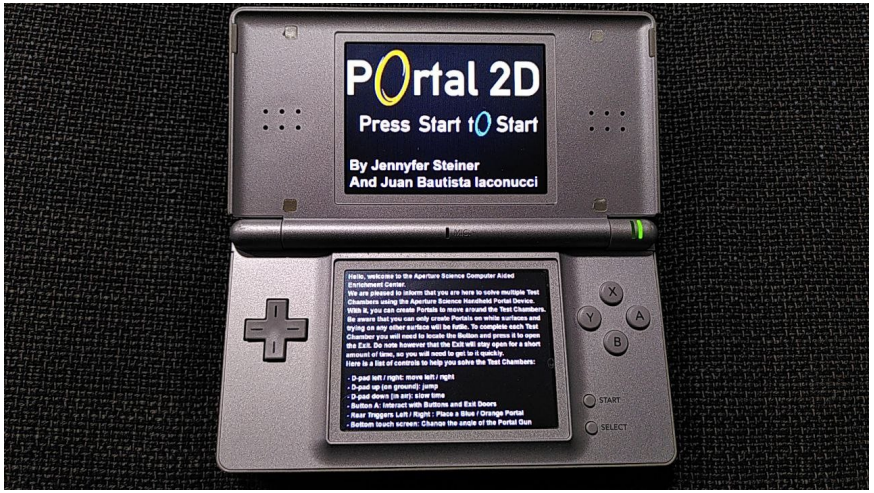
- **Sound**
  - describe how you use the sound devices (speakers or input channels) in the project
  - We used the speakers in order to give audio feedback for interactions with buttons, shooting the portal gun, a portal appearing, the character passing through portals and in order to materialize the timer running out at each second before the door get closed again. We also used it to add some background music for the game.

NDS features: checklist (2/2)

- **Sprites (optional)**
  - describe how you use the sprites in the project
  - We used sprites to represent the player location on the map with an animated character (walk, jump, idle) and its orientation for launching portals.
  - We also used sprites for the portal “projectiles” in order to make the paths of the projectiles visible, and then for the successfully placed portals. We decided to use sprites as those elements are animated and often updated.

NDS project screenshot

- **Include an image with the final view/s of your project on the actual NDS device**



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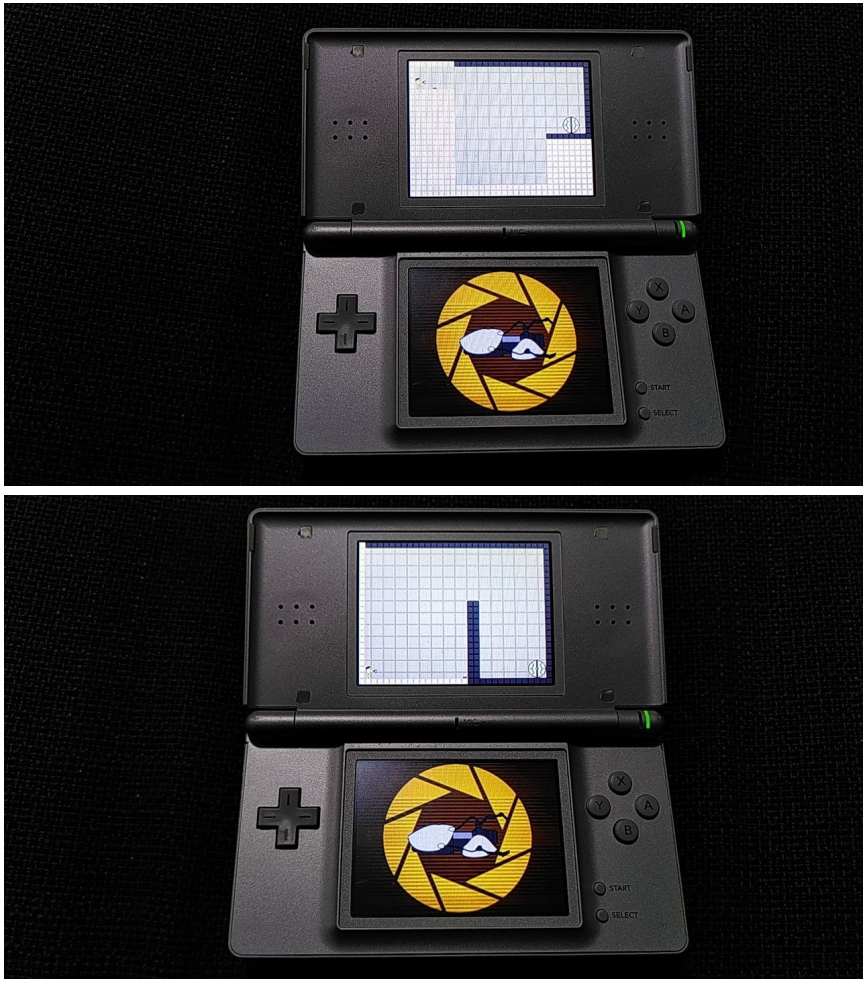

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