

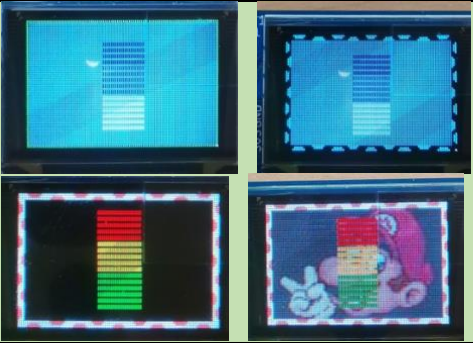









Feature	Feature marks for	Input devices	Feature description	Images
Open screen display and system lock.	Team Improvement	btnC all led all sw all seg all an	<p>Oled will display a welcome page when first programmed, at this time, all leds and segments are off.</p> <p>Following the instructions on the screen, the user will press btnC to enter the system, once btnC is pressed, the word "LOCK" will be shown on the segment, some random leds will light up. If user press btnC again, segment will remain the same, while the pattern of leds will change randomly, the user can change the pattern of leds for unlimited times.</p> <p>To unlock, user need to on all the switches that correspond to all the leds that are on. Once the system is unlocked, segment will be off.</p>	 
Menu for function selection	Team improvement	BtnC, btnU, btnD, SW8	<p>Once user enter the menu, user can use btnD to select down , btnU to select up, and once reach the top or the bottom, press btnU and btnD will let the cursor go respectively to bottom or top. The selected function block will show inverted colour. Press btnC to enter the function chosen by the cursor. User can always turn on SW8 to return to this menu, then user can choose to use another function, after choosing another function, turn off SW8 to exit menu.</p>	
Graphical visualisations and configurations	Ren Tianle	SW11 SW12 SW13 SW14 SW15	<p>SW11: controls the colour mode of oled display</p> <p>SW12: controls thick/thin boarder for the volume bar</p> <p>SW13: controls turning on/off the background picture</p> <p>SW14: controls showing/hiding the volume bar</p> <p>SW15: controls turning on/off the boarder.</p>	

Mario Game ---- Forest	Ren Tianle	SW10 btnC btnU btnD btnL btnR	<p><u>A moon indicator will be shown on the left top of the screen, indicating whether Mario has got the moon or not. The square will be yellow if he has got the moon, otherwise it is white. This applies to the two games below as well.</u></p> <p>SW10: show toad in the map btnL, btnR: control Mario to move left/right. btnC: 1. Get hint from toad when Mario is close enough to toad. 2. Enter the door when Mario is in front of the door. btnD: Control Mario to squat. btnC: Control Mario to do a normal jump. btnD+btnU: Control Mario to do a big jump. Some key points about this level: 1. Mario needs to squat in order to approach toad. 2. Mario needs to get the moon in order to enter the door and to next level. 3. A normal jump is not high enough for Mario to reach the door. He needs to do a big jump, which is exactly what toad will tell him if he approaches toad. The hint from toad is: "sometimes you need to go lowe to get higher"</p>	
Mario Game ---- Concert	Ren Tianle	SW10 btnC btnU btnD btnL btnR mic	<p>The feature of SW10 and btnC,U,D,L,R are the same as Mario Game ---- Forest</p> <p>Some keys points about this level: 1. The moon is initially invisible, user will have to make some noise in order to see the moon. Additionally, in order to view the moon constantly, user will have to keep the music on, otherwise the moon will be invisible again. 2. The hint from toad in this level is: "you are at a concert, so.... How about some music!" 3. A normal jump is still not high enough; Mario needs to do a big jump as well.</p>	
Mario Game---- Xi'an	Ren Tianle	SW10 btnC btnU btnD btnL btnR SW0 SW2 SW9	<p>The feature of SW10 and btnC,U,D,L,R are the same as Mario Game ---- Forest</p> <p>Some key points and explanation about this level: 1. The moon is initially invisible, the user will have to turn on SW0,SW2,SW9 in order to view the moon. 2. The hint from toad is "look around, where is the hometown of your creator. HINT: use three digits to represent it".</p>	

			<p>3. Explanation: The background of this level is a picture of Da Yan Ta (大雁塔), the ground of this level is designed to look similar to the City Wall of Xi'an (西安城墙), and the user can also directly ask the creator of this Mario (which is me hahaha) to get to know that the city is Xi'an. The phone area code for Xi'an is 029, and this is why SW0,2,9 are chosen to be the password.</p> <p>4. Once SW0,2,9 is on, the moon will show up and there would be a koopa shown on the right corner of the screen. User could approach koopa and press btnC to see a picture of Da Yan Ta in winter.</p> <p>After entering the door, a message saying "Thank you for playing my game" will show up on the oled.</p>	 
Real-time audio volume indicator	Peng Fei	SW0 SW1	<p>SW0 = 0 or 1: show peak value sampled by peak algorithm or show mic_in on 16 LEDs</p> <p>SW1 = 0 or 1: seven segment display shows L,M,H or numbers from 0 to 15 depends on signal selected by SW0 (peak value or mic_in)</p>	
Snake game	Peng Fei	SW4 SW5 SW6 btnL btnR btnU	<p>To start the game, choose a speed first: SW4 to SW6 = 3'b100: slow speed. SW4 to SW6 = 3'bZ10: medium speed. SW4 to SW6 = 3'bZZ1: fast speed. SW4 to SW6 = 3'b000: pause, to resume the game, just choose a speed and the game will automatically resume. Press btnU to restart the game. Press btnL : snake turn left Press btnR : snake turn right (left and right depend on snake's current moving direction) Seven-segment display: show the current score user get, eat one point will increase score by 1 If snake hits the border or its body/tail, then it means that snake will die, the whole snake will turn into white and remain static until user press btnU to restart.</p>	

Reference:

Snake game: <https://www.instructables.com/Snake-on-an-FPGA-Verilog/>

Utilization of the board:

