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Outline

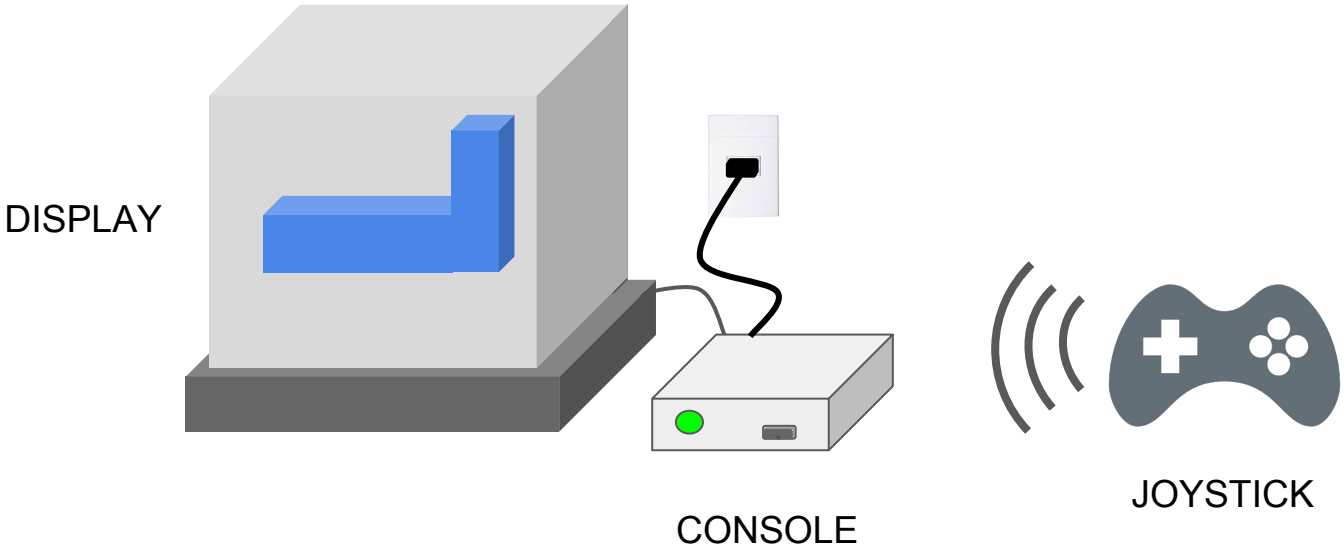
- Remembering the idea;
- Modules;
- Modeling:
  - Block Diagram;
  - Activities Diagram;
  - Use Case Diagram.
- Hardware and Software;
- Display Schematic;
- Related works;
- References.

Remembering the idea

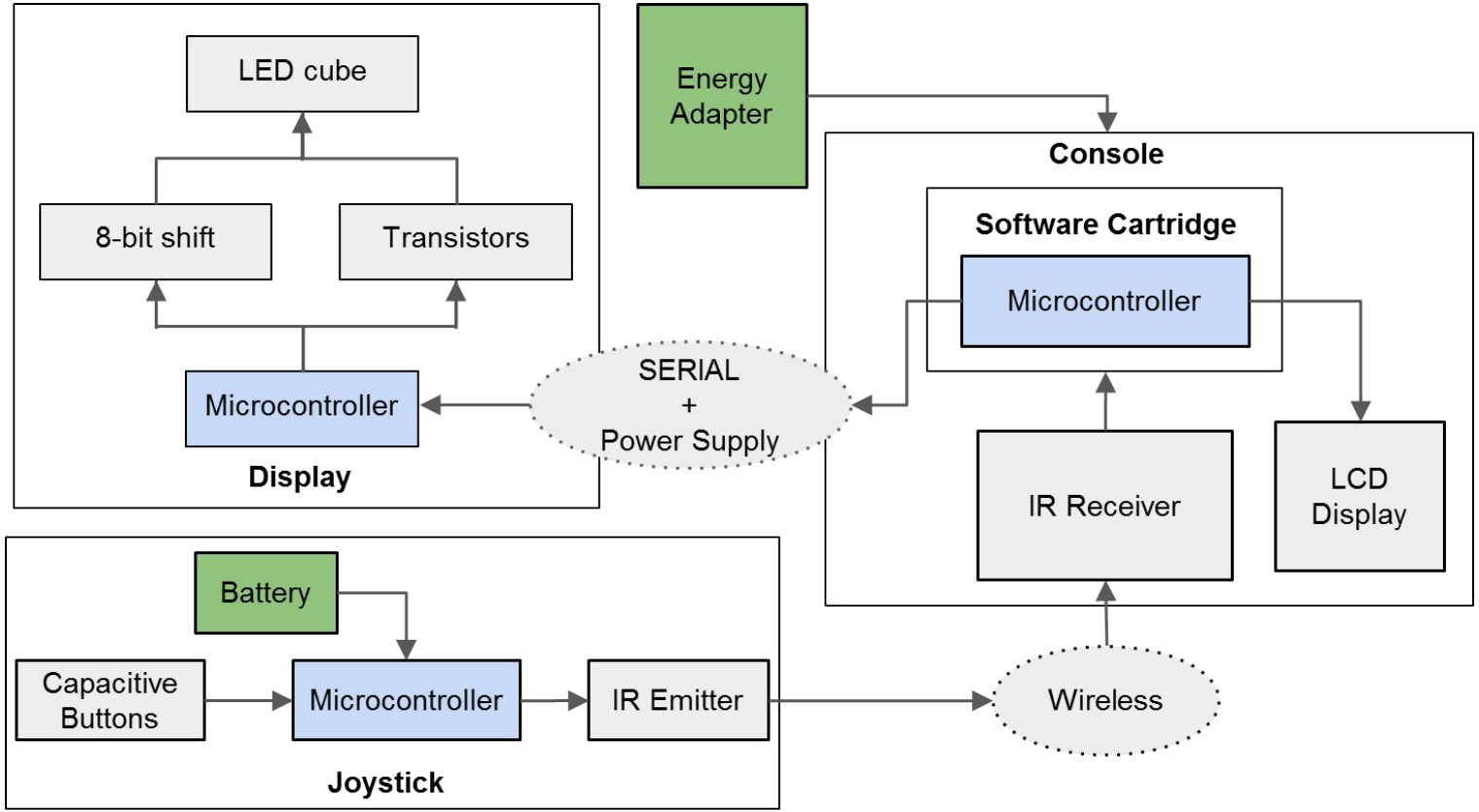
- Traditional Tetris game;
- Transport the idea from 2D to 3D environment;
- Show the pieces in a “hologram” made by a LED cube with 512 LEDs;
- The user interaction is made by a wireless joystick;
- Show the score on a LCD display;
- Make the display adaptable for other applications, like plot 3D graphics.

http://java.mob.org.pt/game/tetris_2012.html

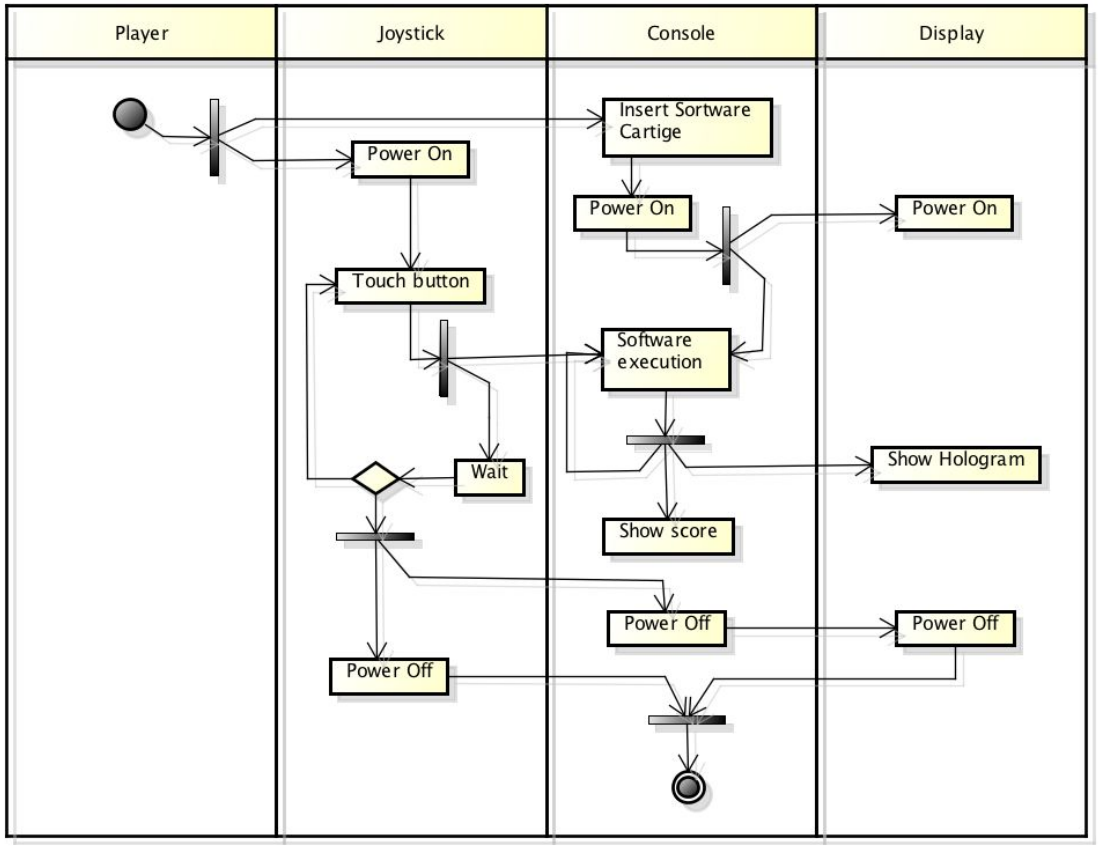
Modules



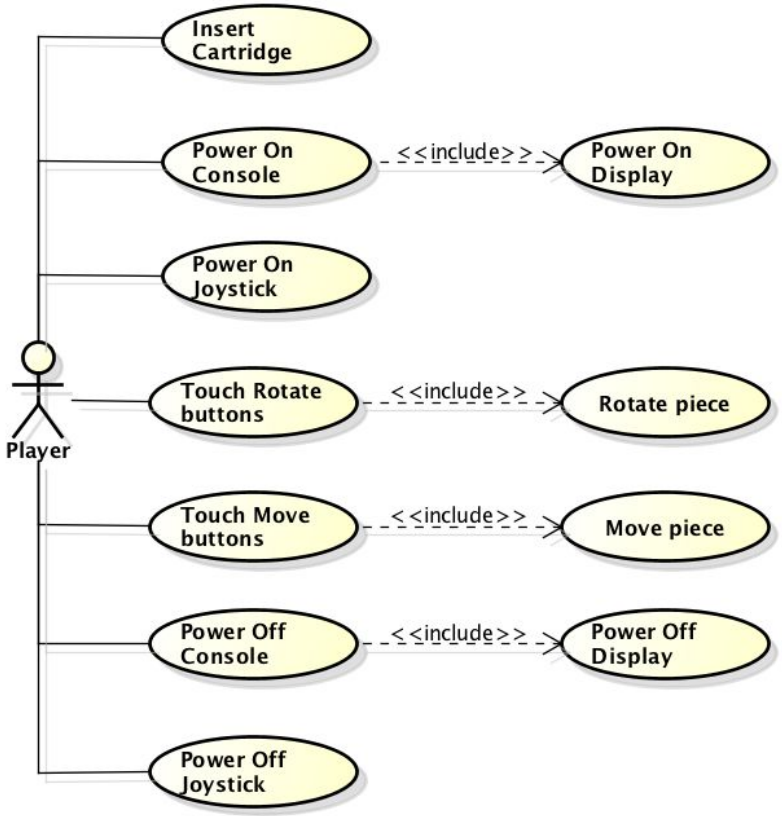
Block diagram



Activities diagram



Use case diagram



Hardware and Software

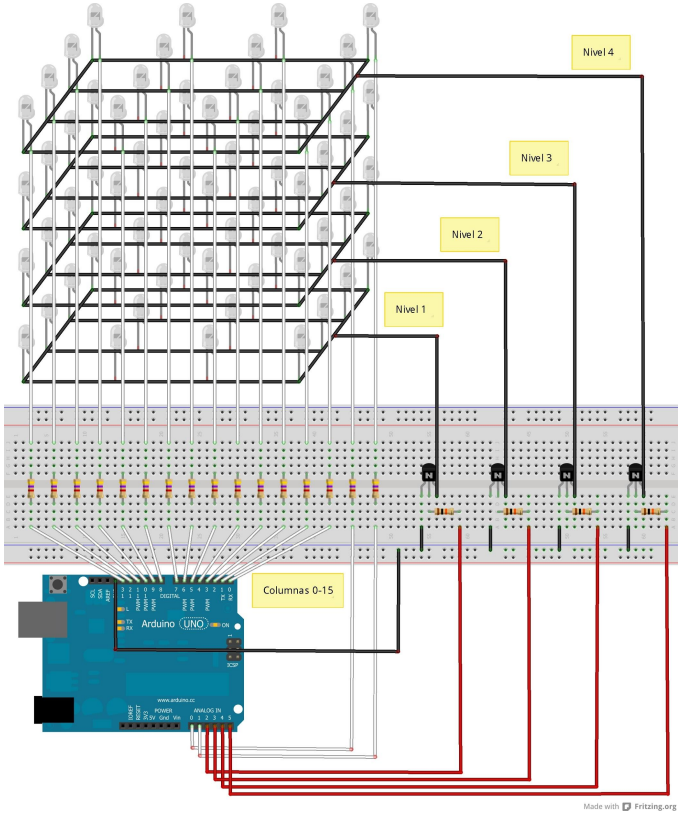
Hardware

- Arduino UNO for the modules;
- IC 74HC595 for the 8-bit shift;
- IC TD62083 for the set of transistor;
- 16x2 LCD to show the score.

Software

- Arduino IDE to implement the software for the modules;
- C/C++ language.

Display Schematic (example)



Related works

- Three Dimensional Cubic Display and Lattice Analysis using Proteus Simulator (paper):
  - **Similarities**: Some hardware components like the same ICs for shift and transistors, Serial communication, cube dimension, microcontroller from Atmel, one color;
  - **Differences**: Type of microcontroller (AT89C52), a desktop computer to process what will be shown on the cube, different applications.
- L3D Tetris for 8x8x8 LED Cubes, by Hape (video):
  - **Similarities**: Serial communication, cube dimension, same application;
  - **Differences**: RGB color and a desktop computer to process the game.

References

- http://piserjournal.org/wp-content/uploads/2014/04/V12-316-323.pdf
- http://oni.escuelas.edu.ar/2013/BUENOS_AIRES/1753/proyecto%20cubo%20de%20led/cubo.htm
- www.youtube.com/watch?v=VxLAtcOu18s
- www.youtube.com/watch?v=iezvGa-rWB4
- www.youtube.com/watch?v=aJ3R62_vknI
- fritzing.org/
- www.arduino.cc