By: Lorenzo Nordio, Design by: Gaia Topan

The Cube

Link visualizzazione powerpoint:
https://www.canva.com/design/DAGFsCRG_WQ/arBFvIdUsN2f_ysPGKdJyw/view?utm_content=DAGFsCRG_WQ&utm_campaign=designshare&utm_medium=link&utm_source=editor

L’idea

THE CUBE is a cutting-edge watch that reflects your mood in a unique and engaging way. Equipped with six buttons, it allows you to select, among six smileys, the one that best represents your mood
Furthermore, reading the time becomes an interactive experience: with a simple clap of your hands or by pressing a button you can view and hear the current time.
THE CUBE makes time control practical and pleasant, combining technology and emotion in an elegant accessory.

Schema elettrico e ultiboard

To create the electrical diagram I chose to create a shield for Arduino in order to have easy connections. In the shield there are connections for the 7 buttons for the matrix, for the potentiometer that regulates the brightness, for the photoresistor, for the microphone, and for the 5V input power supply. To control the speakers there is an I2C communication between the Arduino Uno R4 WiFi and the ATmega328p. The ATmega328p also has connections to the amplifier which amplifies the signal to be sent to the speakers. To operate, a 16 Hz oscillator is connected to the ATmenga328p, pin 1 (reset) is connected in a pull-up configuration. Between the amplifier and the ATmega328p there is a filter that serves to reduce noise.

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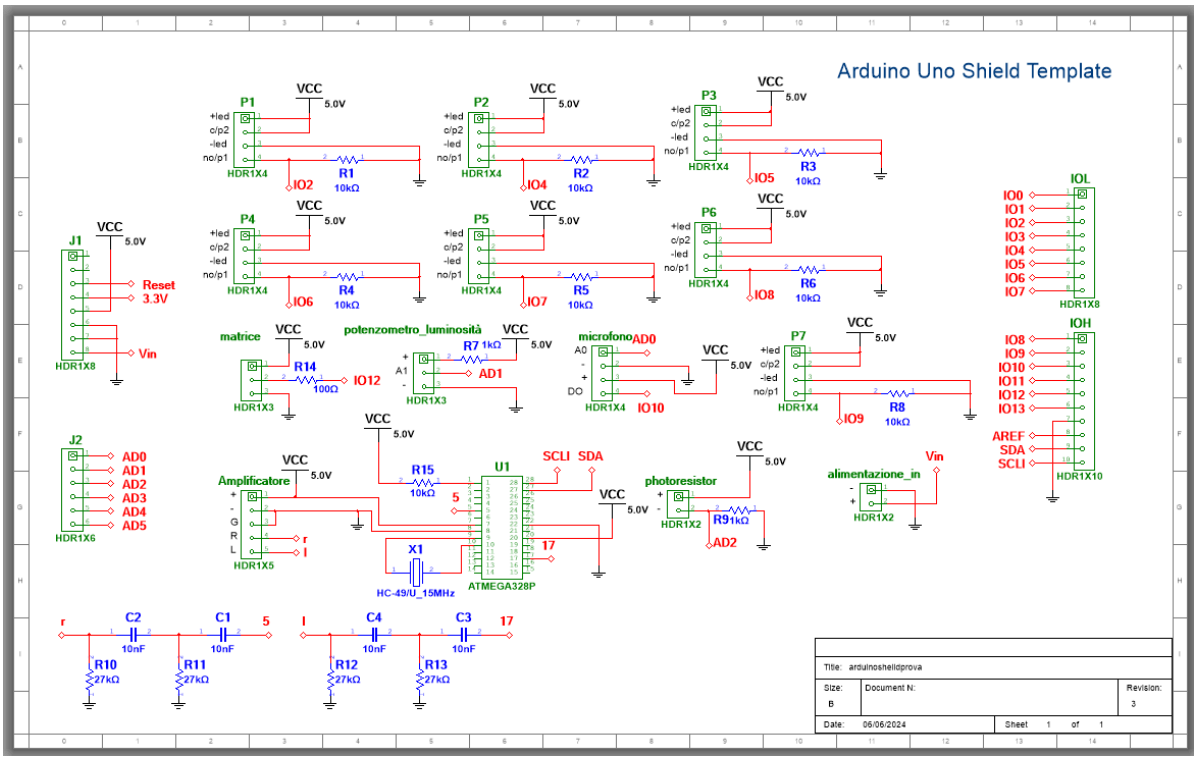
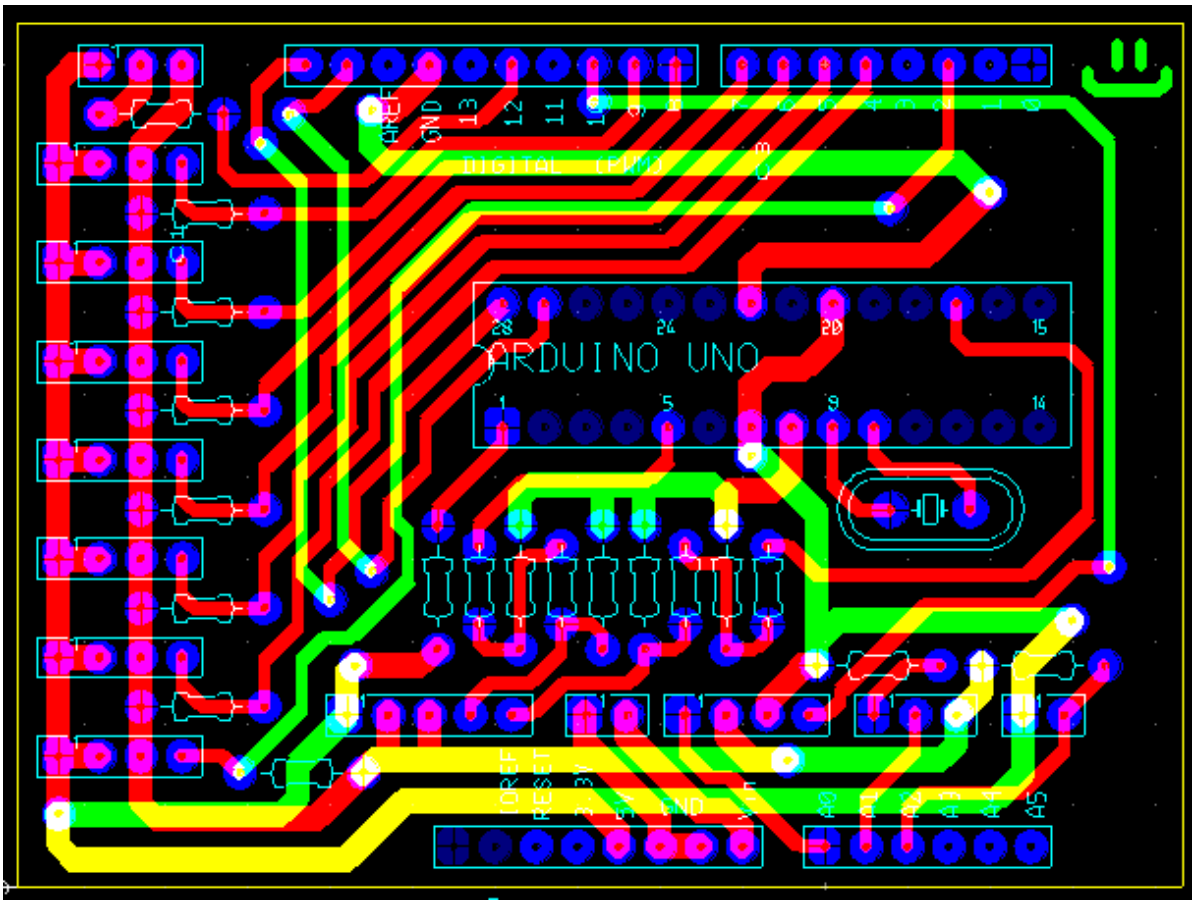
Schematic



Ultiboard



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Codice

In the following link there are the codes for the operation of the Arduino Uno R4 WiFi and the ATmega328:
https://github.com/nordio07/The-Cube.git

The control of the matrix - with WS2812b LED - is allowed by the “FastLED.h” library.

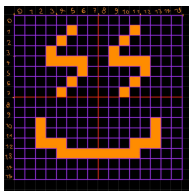
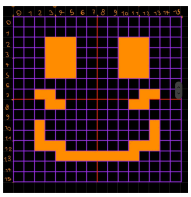
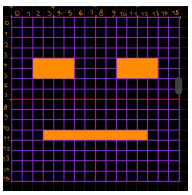
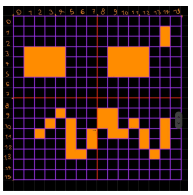
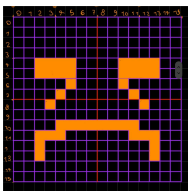
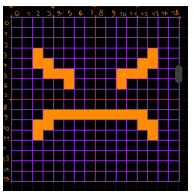
The “WiFiS3.h” library allows communication between the Arduino Uno R4 WiFi chip and the esp32, it is used to initialize the WiFi connection.

The “Wire.h” library allows I2C communication between Arduino uno R4 wifi and the ATmega328p.

The “Talkie.h” library allows the ATmega328p to read the time, the “Vocab_US_Clock.h” and “Vocab_Special.h” libraries include the necessary words.

Funzionamento

When one of the six buttons located on the top is pressed, the smiley changes. There are 6 smileys: energetic, happy, apathetic, anxious, sad, angry. Each smiley has its own color that changes the mood of the watch,

Faccina	Energetic	Happy	Apathetic	Anxious	Sad	Angry
Colore	Orange	Yellow	Greem	Purple	Blue	Red
Progettazione faccine						
Versione finale						

To view the time, simply press the button on the side or clap your hands. Not only is the time displayed, which will have the color of the corresponding face selected, but you can also listen to it via speakers. This is possible via the talkie library, which since it was not compatible with the Arduino Uno R4 wifi I had to do an I2C communication. The Arduino sends the hours and minutes to the ATmega328p, which in turn takes the data online with a wifi connection via the NTP (Network Time

Protocol). The amplifier is equipped with a potentiometer that allows volume adjustment. The photoresistor and the potentiometer allow you to adjust the brightness of the matrix automatically and manually.