Visualisation of Audio using Dot Matrix Display

Submitted by

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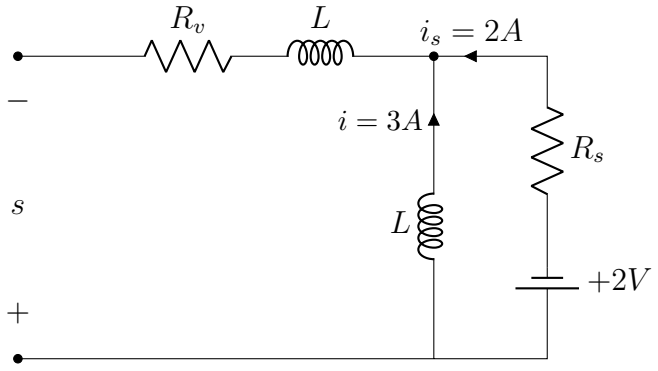
Abstract

From simple music player applications to concerts, audio visualization enhances the ambience and overall experience of the enjoyer. In this project, we replicate a simpler version of such systems using an Arduino UNO development board, 32*8 LED dot matrix display, and a few small components. An audio signal of our interest is preprocessed and fed to one of the analogue pins of Arduino. This signal is then processed using the "ArduinoFFT" library, which splits the audio into discrete chunks and performs FFT on it. The resulting frequency spectrum is then again processed and scaled down to match the width and height of the LED display. Finally, the resulting waveform is displayed. In the end, we try to add more customizations such as different "display modes" and effects.

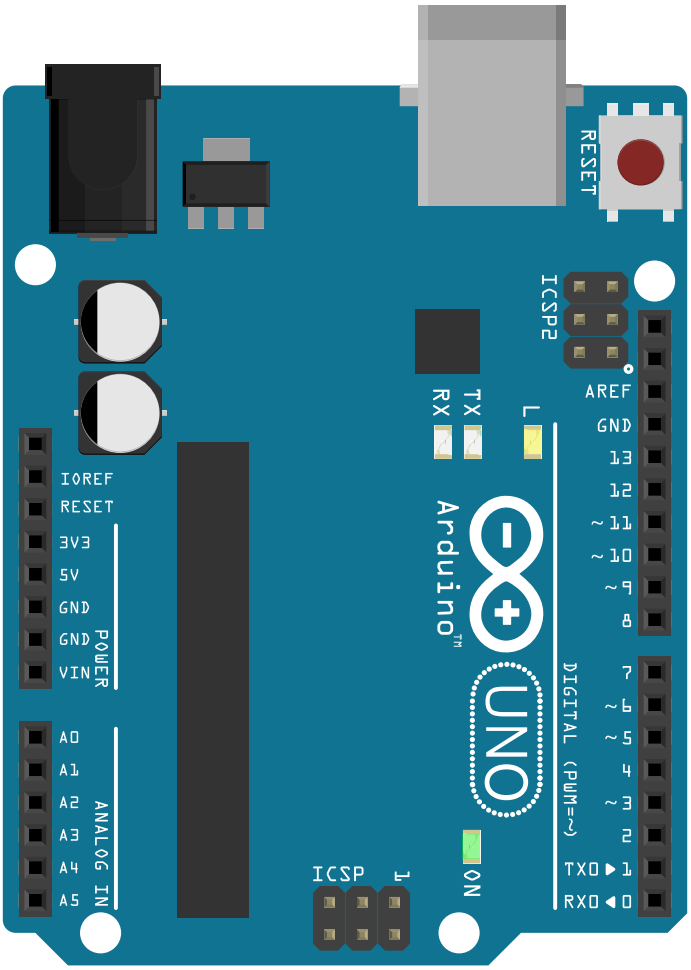
Implementation

Introduction

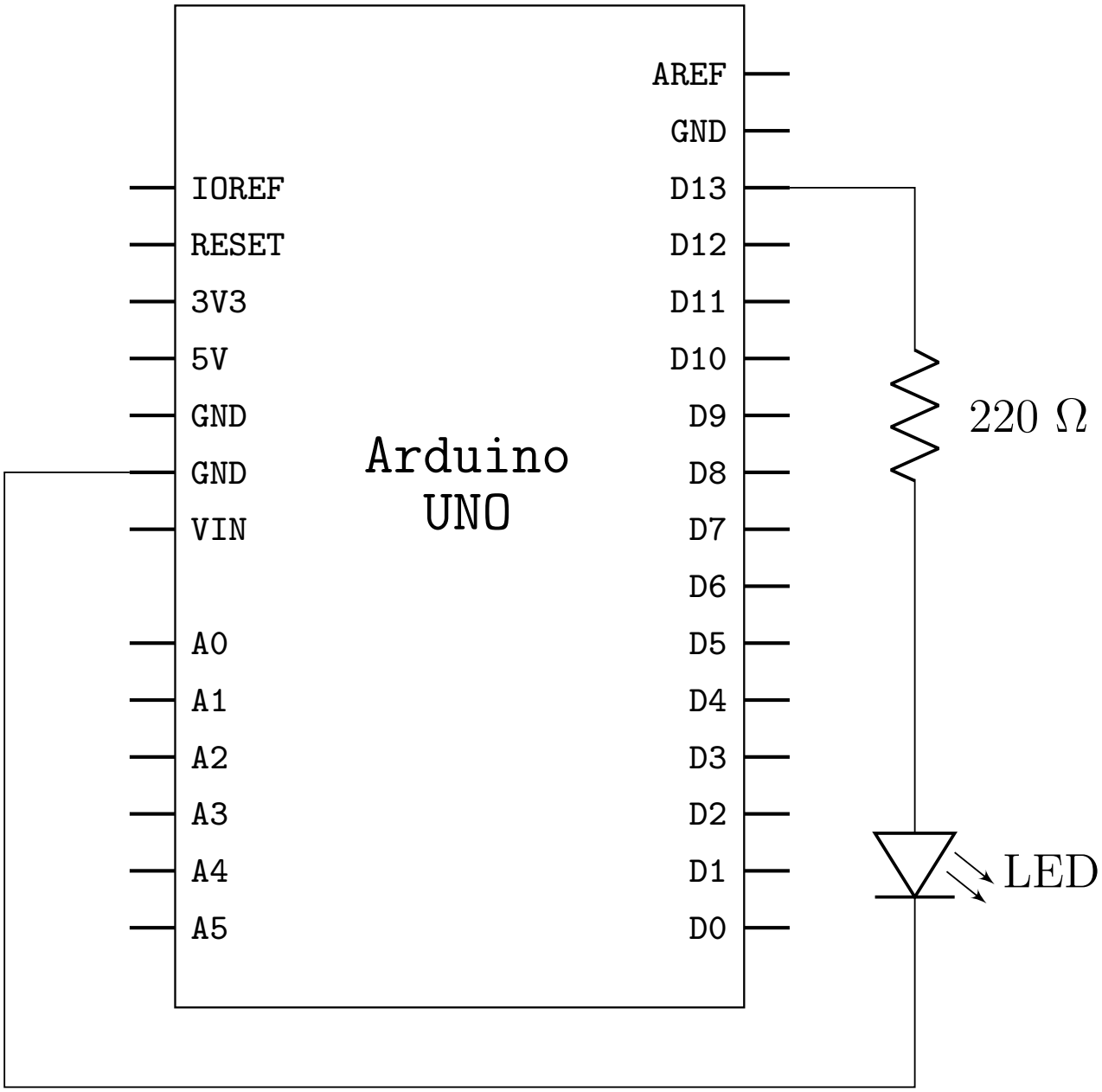
Block Diagram



Arduino UNO


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
TX
RX
L
Arduino™
UNO
ON
ICSP
1
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN

Hardware



Program

```
void setup () {
    pinMode(12, LOW);
}

void loop () {

```

```
}
```

Conclusion