



Politechnika
Wrocławska

Systemy biometryczne

Piotr Giedziun

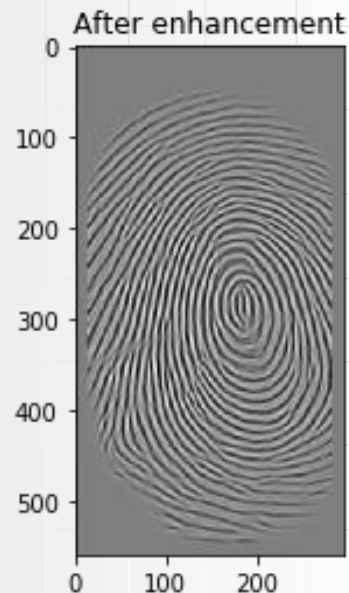
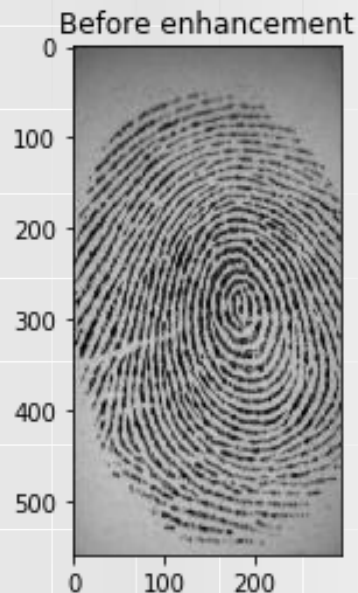
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HR EXCELLENCE IN RESEARCH

Fingerprint

- Typy:
 - optyczny,
 - ultradźwiękowy,
 - pojemnościowy,
 - termiczny



Pętla (lewo)



Pętla (prawo)

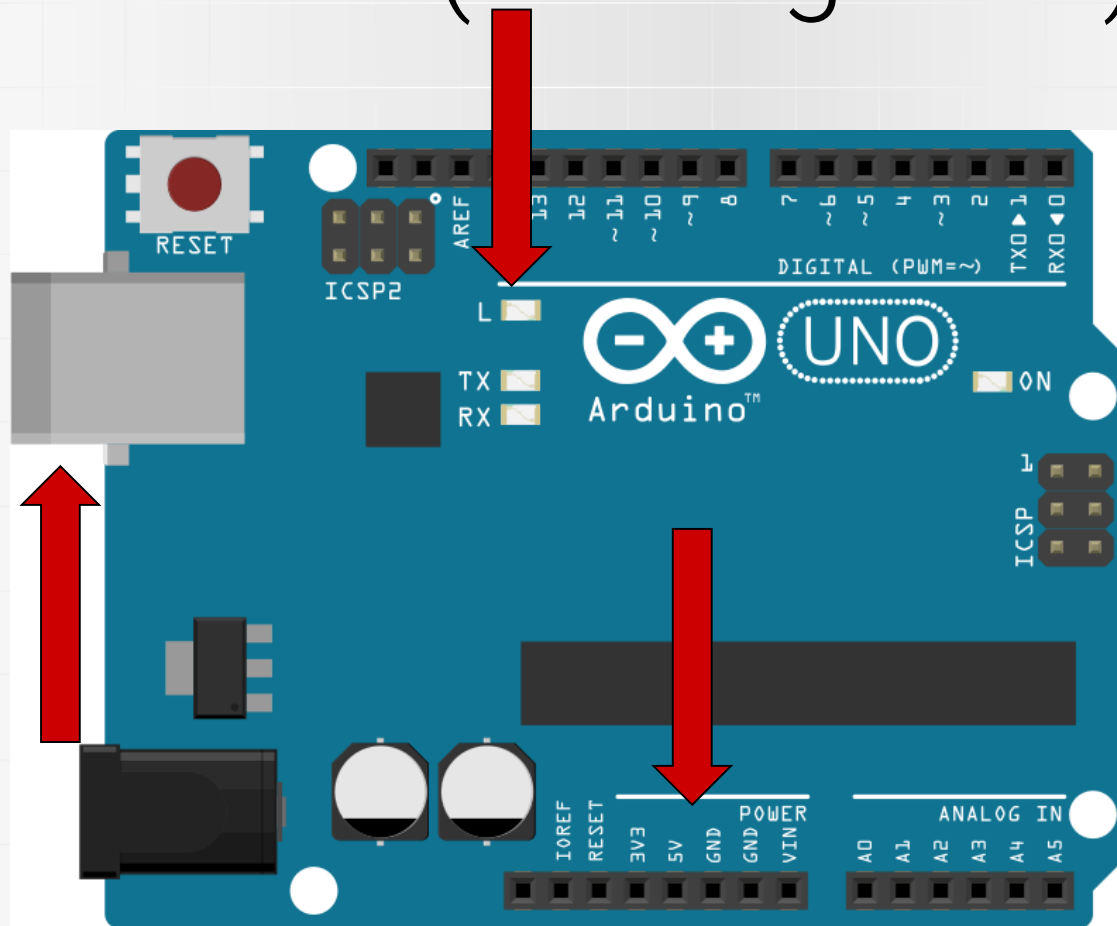


Wir

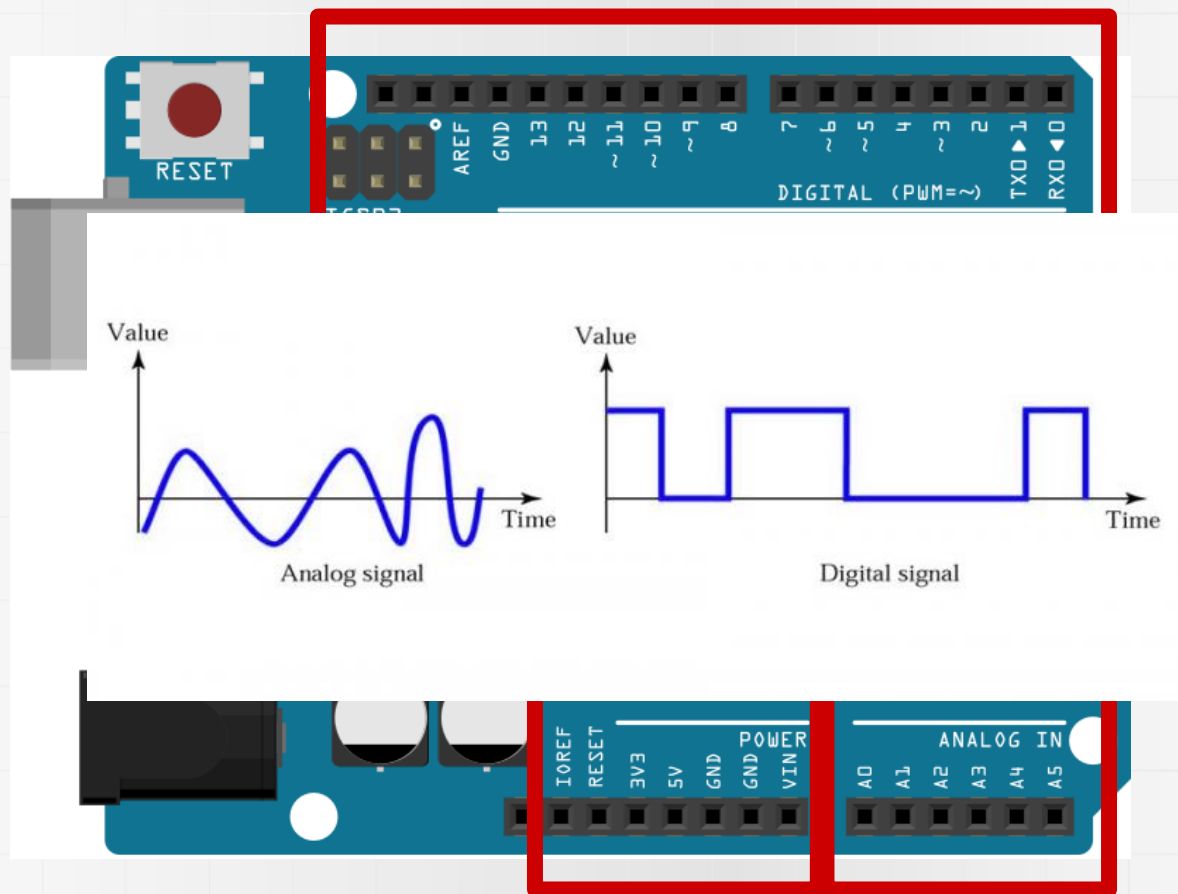


Łuk

Arduino UNO (ATmega328)



Arduino UNO (ATmega328)



Arduino .ino

```
void setup () {}
```

```
void loop () {}
```

Arduino .ino

```
#include "Arduino.h"
```

```
void setup () {}
```

```
void loop () {}
```

```
int main(void)
{
    init();
    setup();
    for (;;)
        loop();
    return 0;
}
```

Documentation:

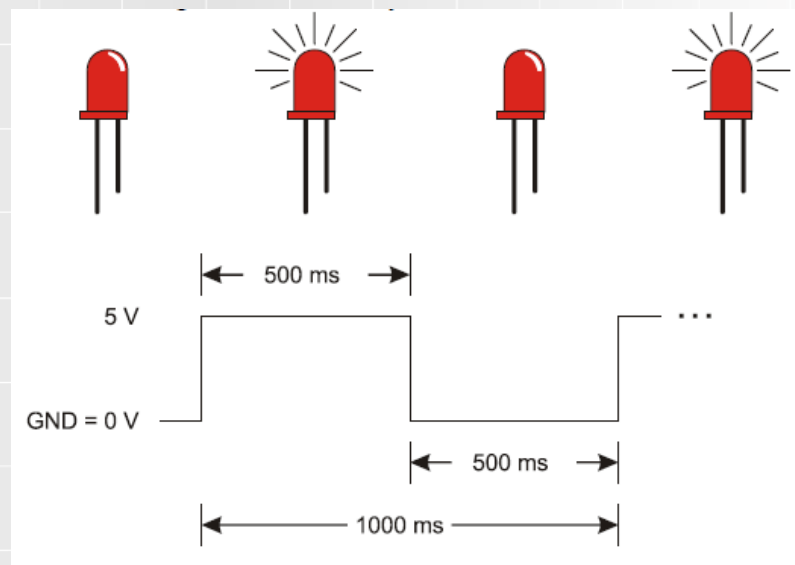
[https://www.arduino.cc/reference/en/
#functions](https://www.arduino.cc/reference/en/#functions)

Plan zajęć

1. Blinking LED
2. UART
3. Serial Monitor
4. Fingerprint module

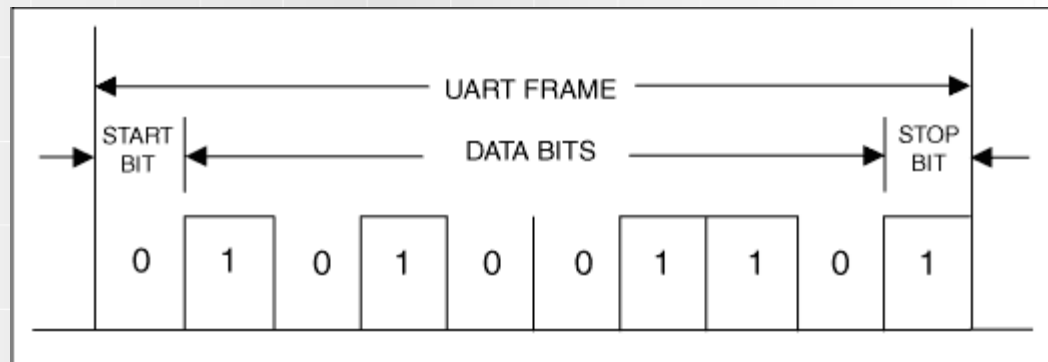
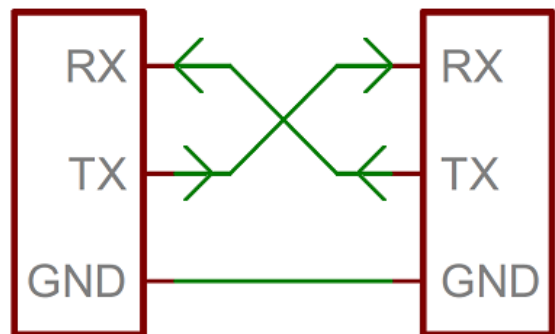
Blinking LED

- pinMode ([docs](#))
- digitalWrite ([docs](#))
- delay ([docs](#))



UART

- szeregowe wysłaniu ciągu bitów
 - prędkość przesyłu danych (baud-rate)
- określa ilość transmitowanych bitów na sekundę



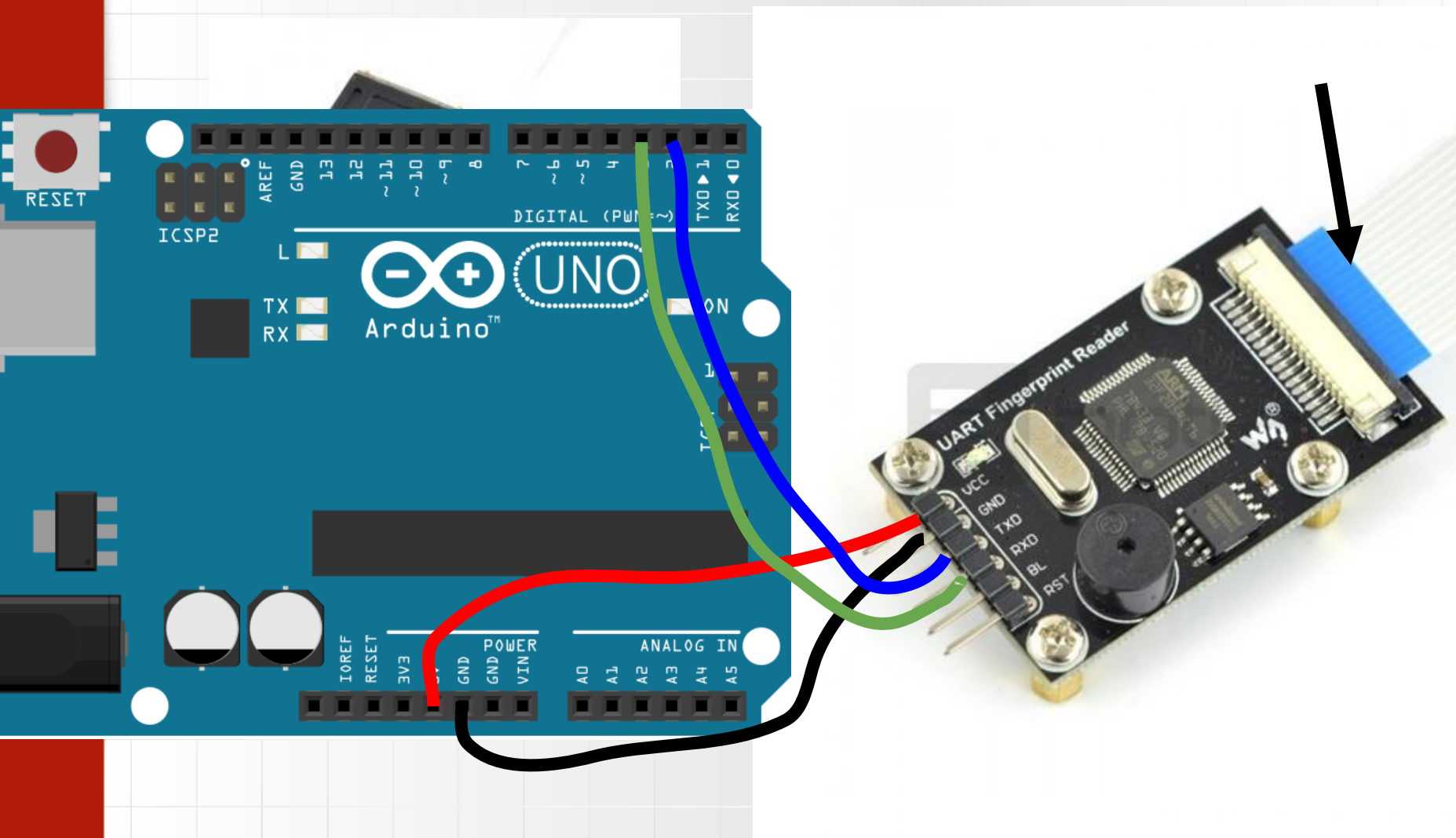
Serial Monitor

- Serial (docs)
- Read line (docs)
- Print line (docs)

Fingerprint

- Czytnik linii papilarnych + STM32F205
 - Optyczny sensor HD
 - Pojemność pamięci: 1000 odcisków
- User Manual ([PDF](#))
- Base code ([link](#))
 - <https://bit.ly/32VgVKo>

Fingerprint - STM32F205



Fingerprint - User Manual

1) = 8 bytes, data format as below:

Byte	1	2	3	4	5	6	7	8
Command	0xF5	CMD	P1	P2	P3	0	CHK	0xF5
Respond	0xF5	CMD	Q1	Q2	Q3	0	CHK	0xF5

Note:

CMD: Command / response type

P1, P2, P3: Command parameter

Q1, Q2, Q3: Response parameter

Q3 mainly used to return the effective operating information, there will be the following values:

```
#define ACK_SUCCESS    0x00    //Operation successfully
#define ACK_FAIL       0x01    // Operation failed
#define ACK_FULL       0x04    // Fingerprint database is full
#define ACK_NOUSER     0x05    //No such user
#define ACK_USER_EXIST 0x06    // User already exists
#define ACK_FIN_EXIST  0x07    // Fingerprint already exists
#define ACK_TIMEOUT    0x08    // Acquisition timeout
```

CHK: checksum value, XOR value for the second byte to the sixth byte

Communication

DSP module works as a slave device, the master device control it by sending related commands.

Command interface: 19200bps; 1 start bits; 1 stop bits (parity bits: none)

Następne zajęcia

- Transmisji danych z układu biometrycznego w oparciu o transmisję szeregową IRDA / UART
 - IR Receiver ([docs](#))
 - Saleae Logic Signals Analyzer



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