Applied Arduino Programming for neurophysiology (supplementary materials)

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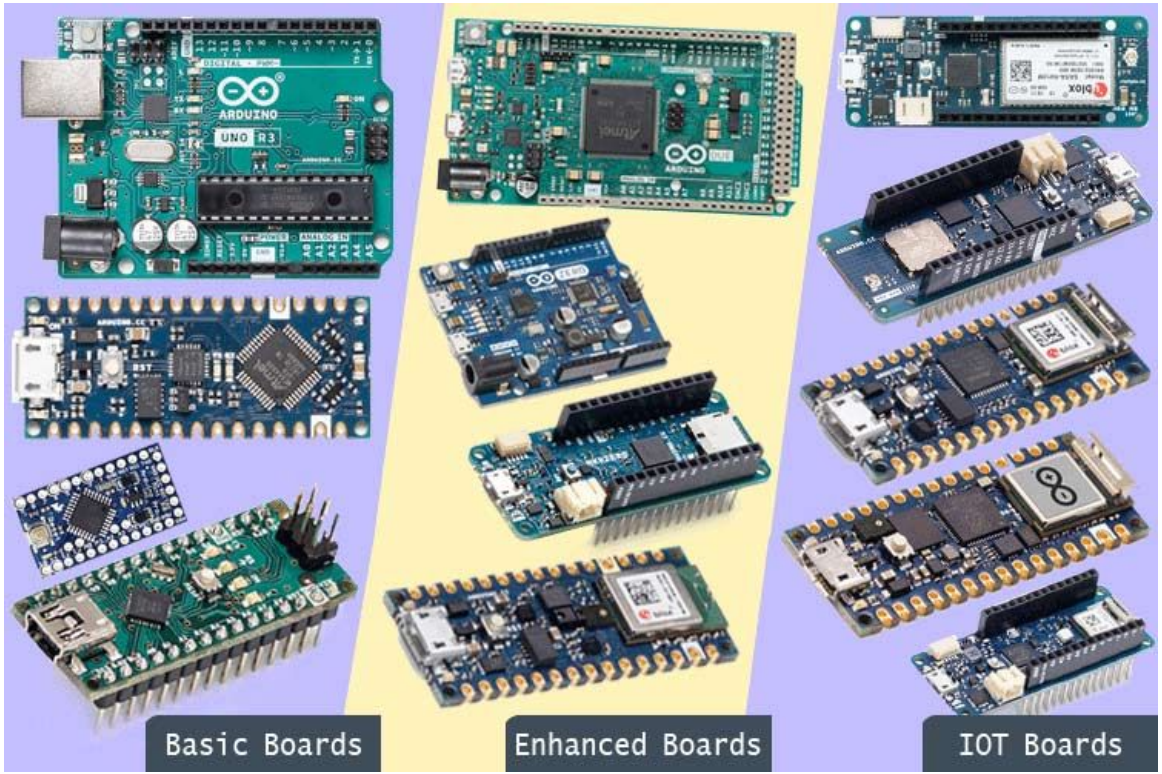
Фонд интеллект

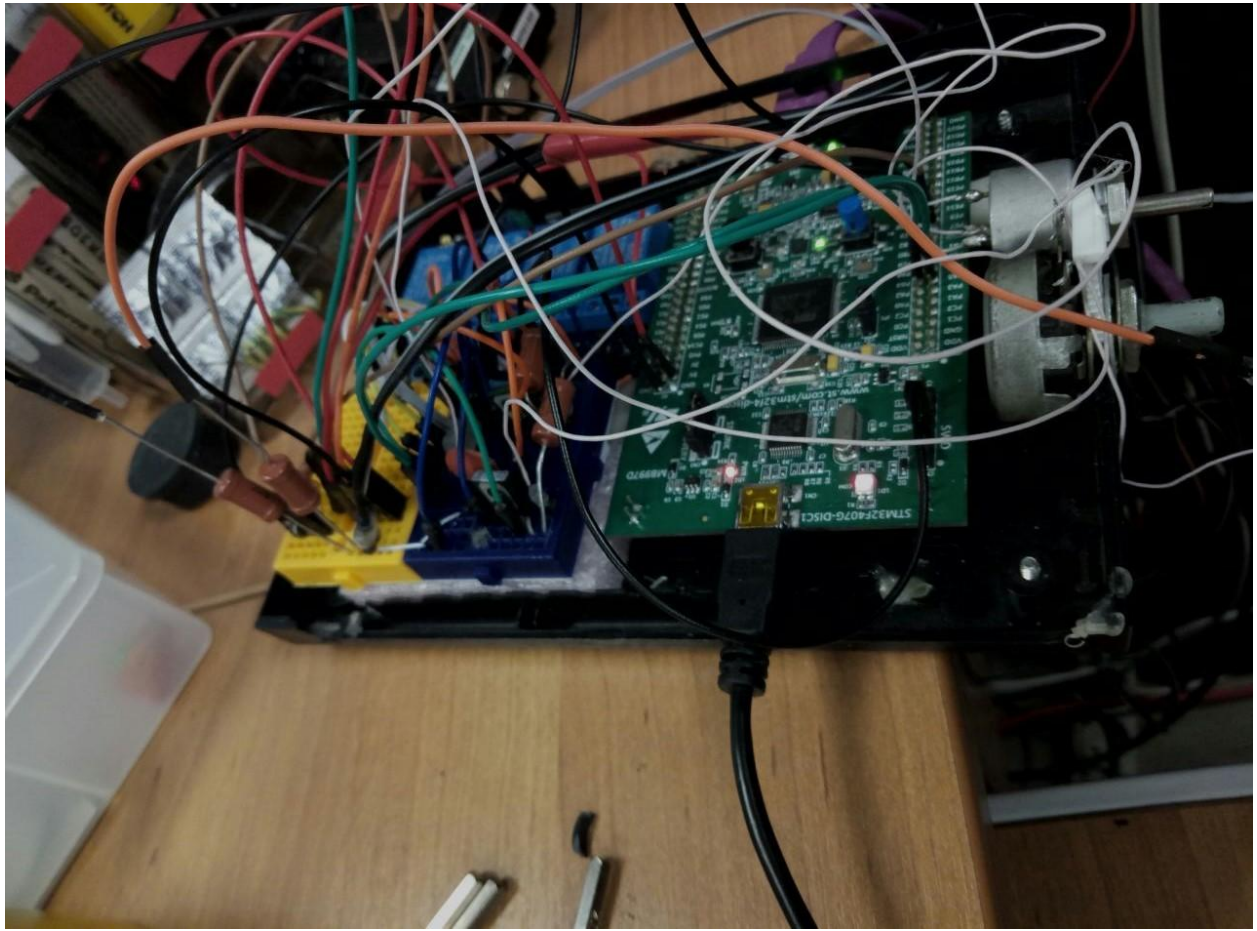
What is Arduino?

- Company
- Platform (both, hardware + software)
- Workstyle … not a good one (toxic DIY)



Фонд интеллект

Toxic DIY

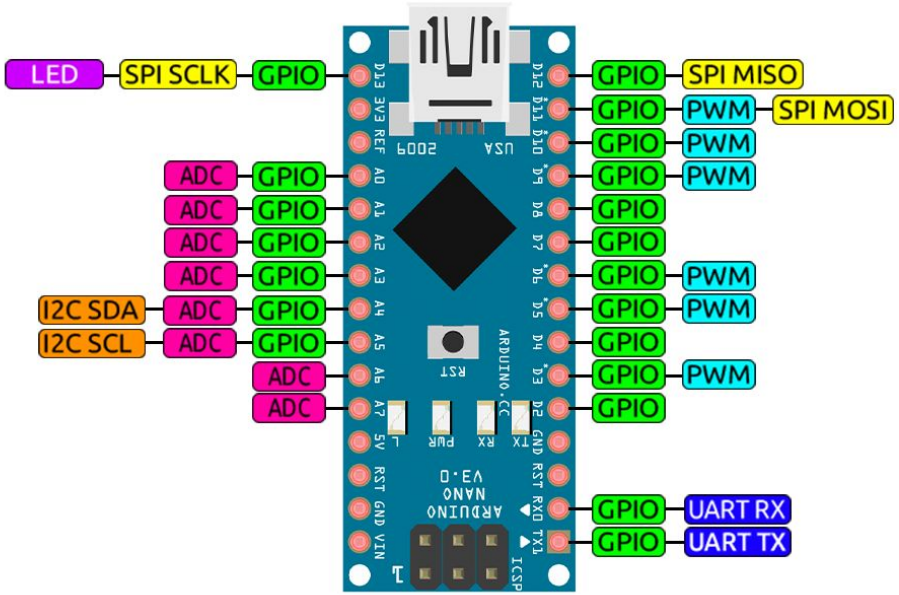


Фонд интеллект

What should we use Arduino for?

- PC-Hardware communication
- Collecting data
- Synchronizing with external hardware (PC or amplifier)
- Producing stimuli
  - Tactile
  - Visual
  - Audial
- Install EasyEDA for schematic design

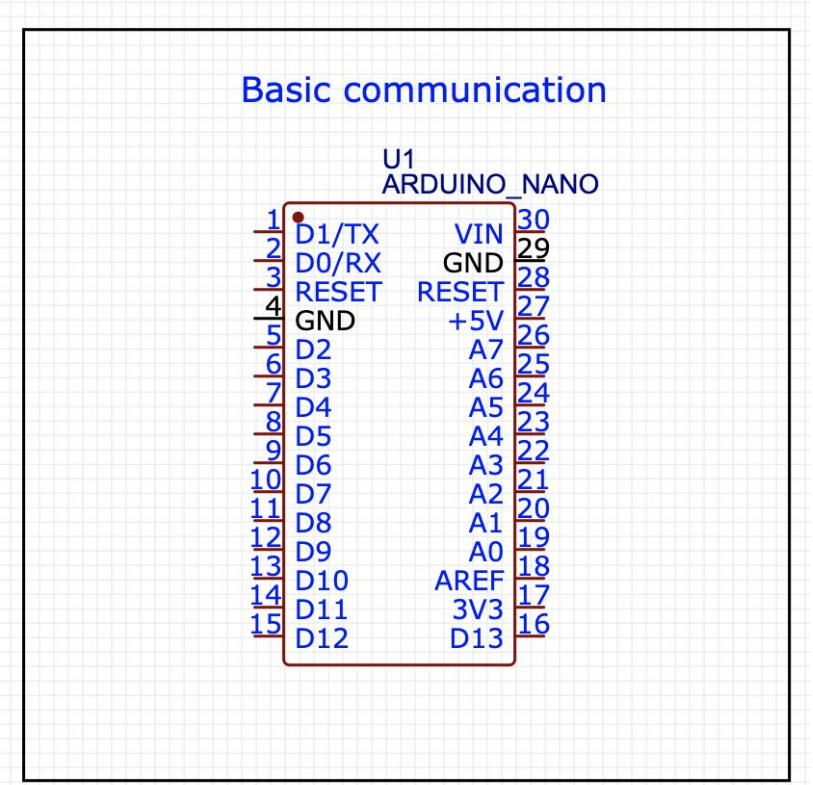
We will work with **Arduino Nano V3**



Фонд интеллект

PC-Hardware communication

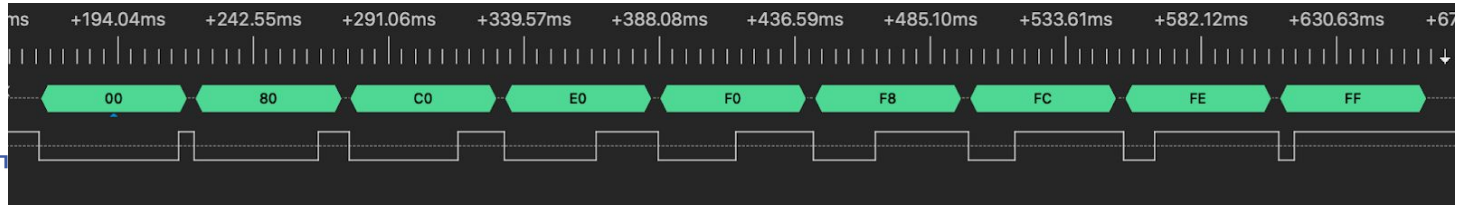
- Download and install Arduino Studio
- Connect to PC
- Flash blink example
- Flash serial example
- UART is not immediate!!!
  - Try echo loop



Фонд интеллект

What is Boudrate?

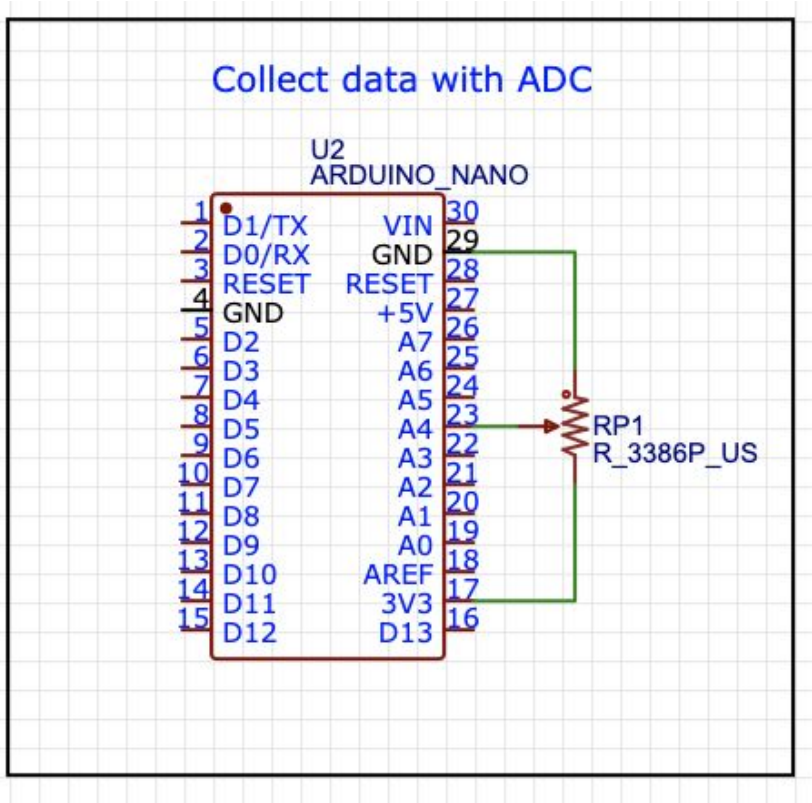
```
[*]: while True:
         for b in ['00000000', # целый 50 ms
                   '10000000', # 8/9 * 50 ms
                   '11000000', # 7/9 * 50 ms
                   '11100000', # 6/9 * 50 ms
                   '11110000', # 5/9 * 50 ms
                   '11111000', # 4/9 * 50 ms
                   '11111100', # 3/9 * 50 ms
                   '11111110', # 2/9 * 50 ms
                   '11111111'\ # 1/9 * 50 ms
                  ]:
             ser.write(bytearray([int(b, 2)]))
         print(time.time(), end='\r')
         time.sleep(1)
```



Фонд интелл

Collect data with analog to digital converter (ADC)

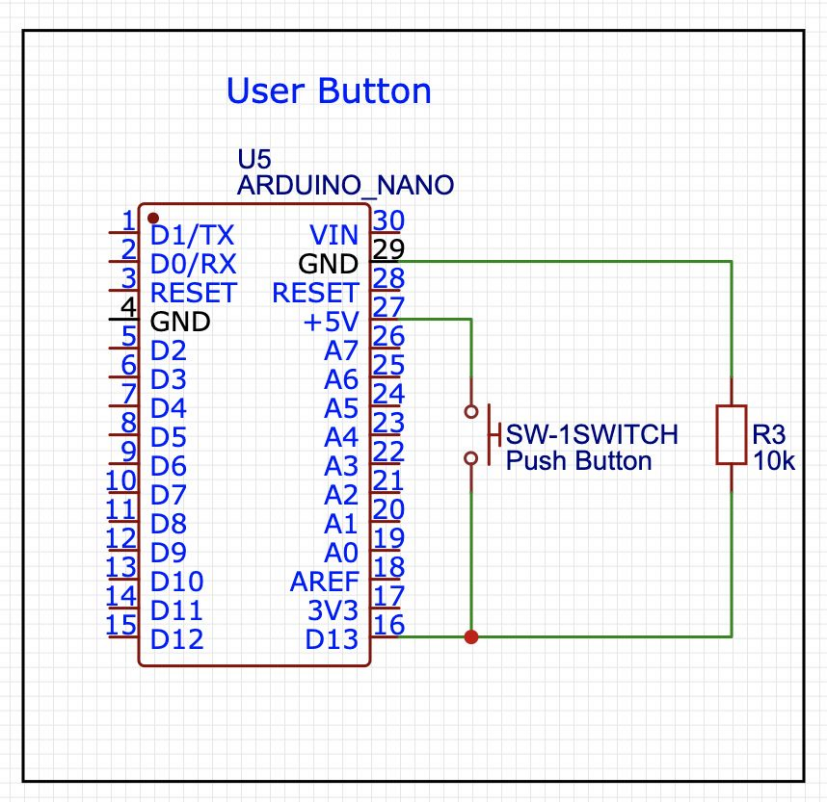
- Learn how to work with Serial Monitor and Serial Plotter



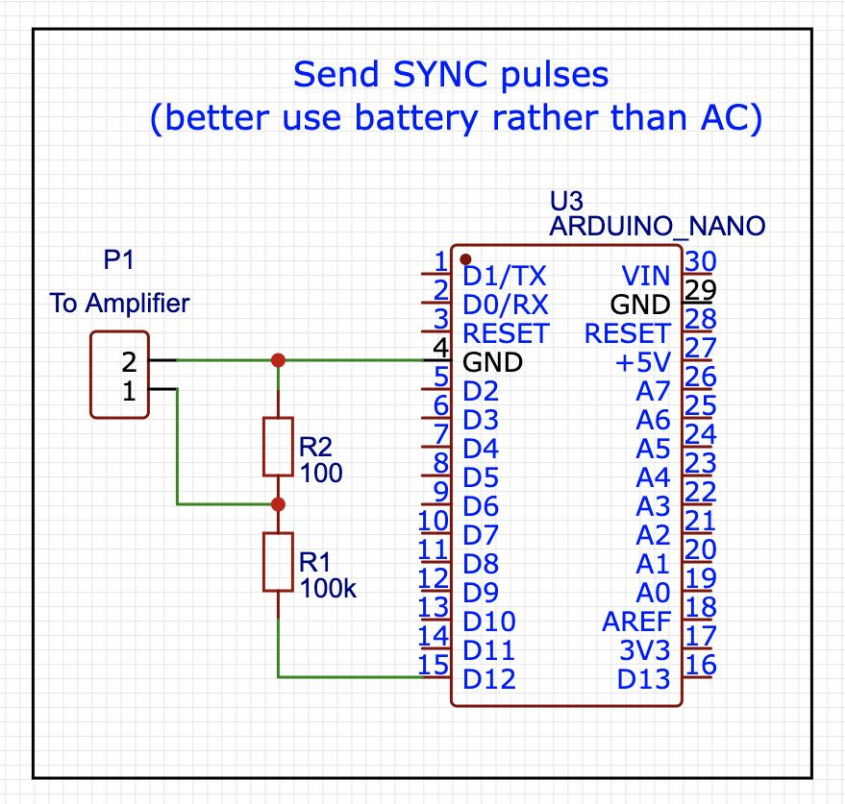
Фонд интеллект

User Button

- Mind pull-down (or pull-up) resistor
- Mind jittering effects (software)

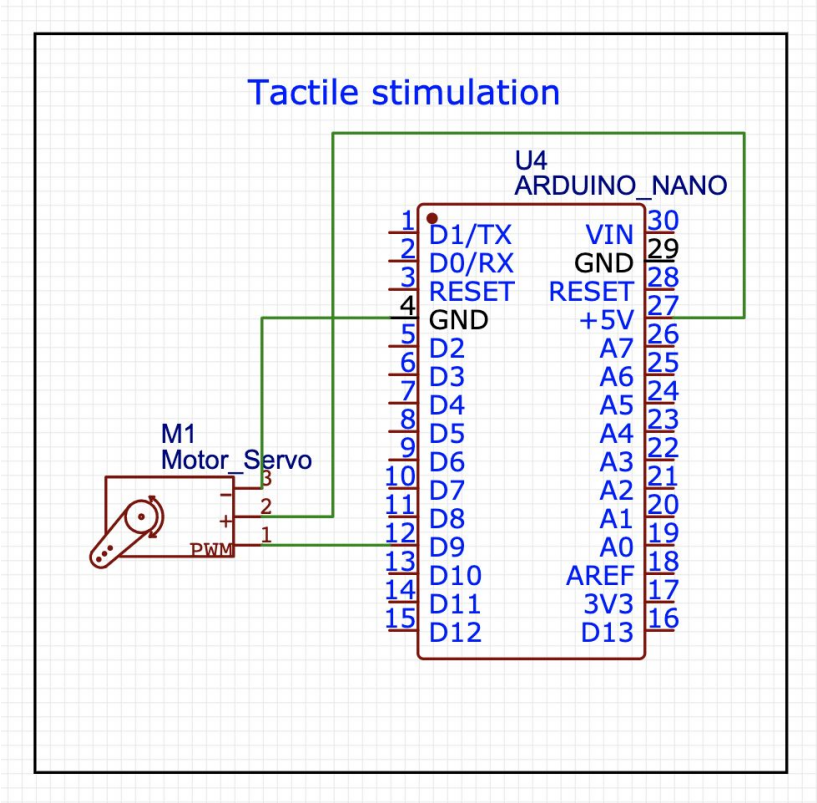


Send Synchropulses to Hardware



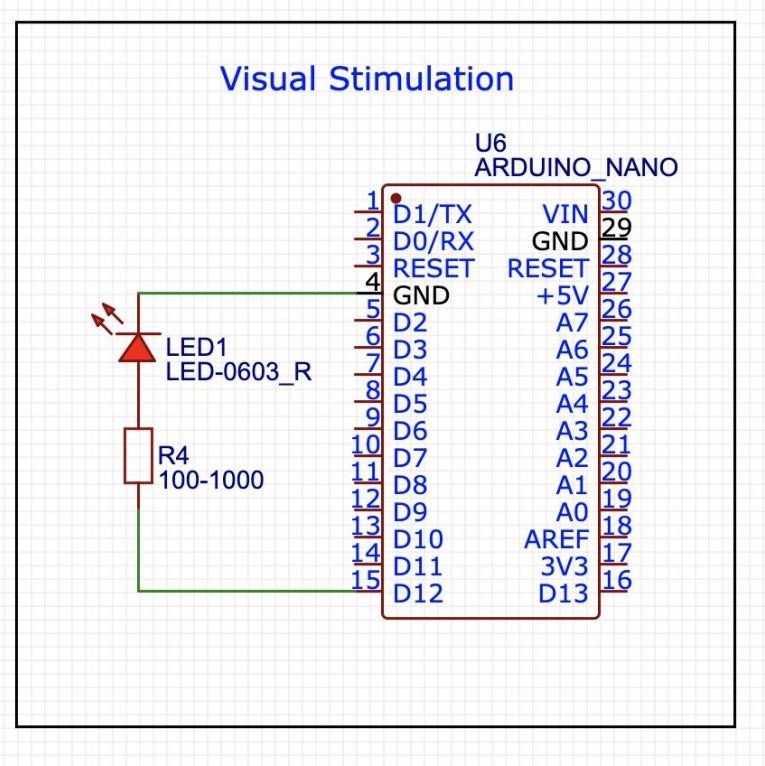
Фонд интеллект

Stimuli: Tactile



Фонд интеллект

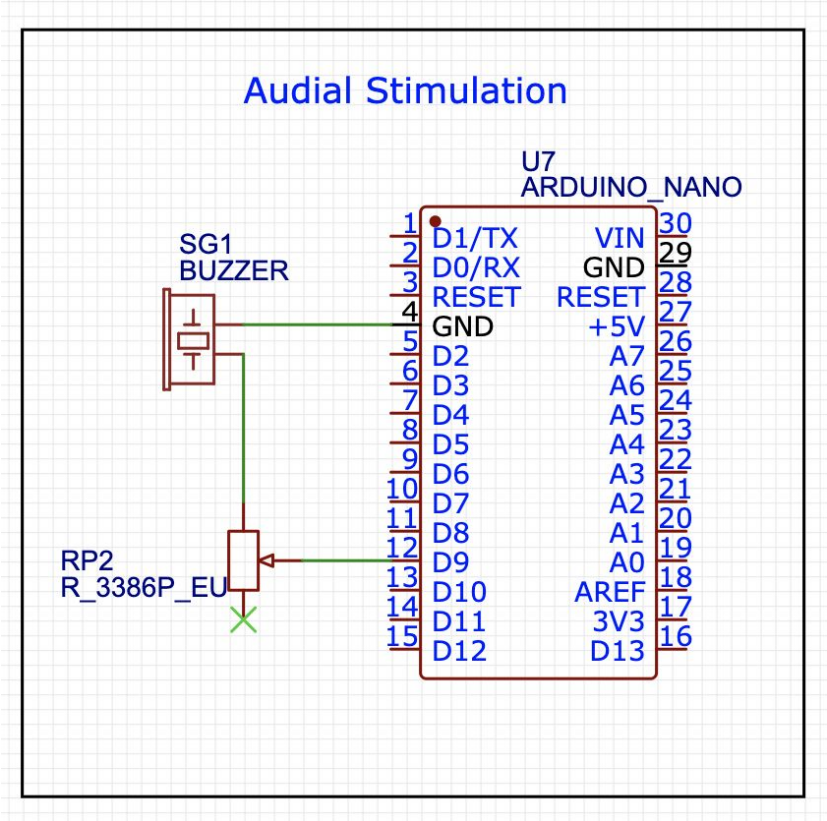
Stimuli: Visual



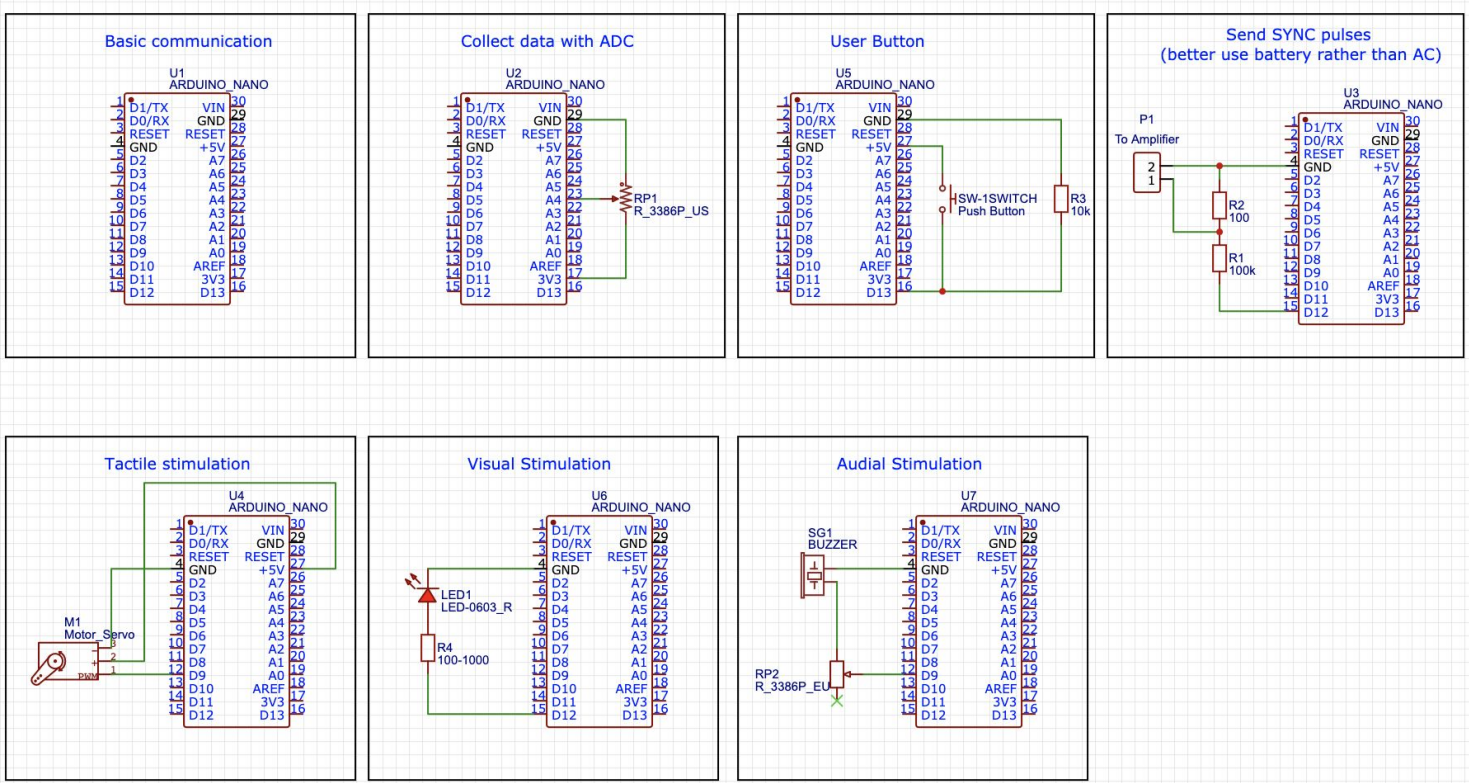
Фонд интеллект

Stimuli: Audial

- Be gentle — use potentiometer to decrease buzzer volume



Don’t be afraid of trials and errors



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