



Stretchalyzer 1

“Measurable improvement of one’s health over time.”

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Why

- Office workers
- Prolonged sitting
- Health problems (Back, neck, shoulder, etc.)



How

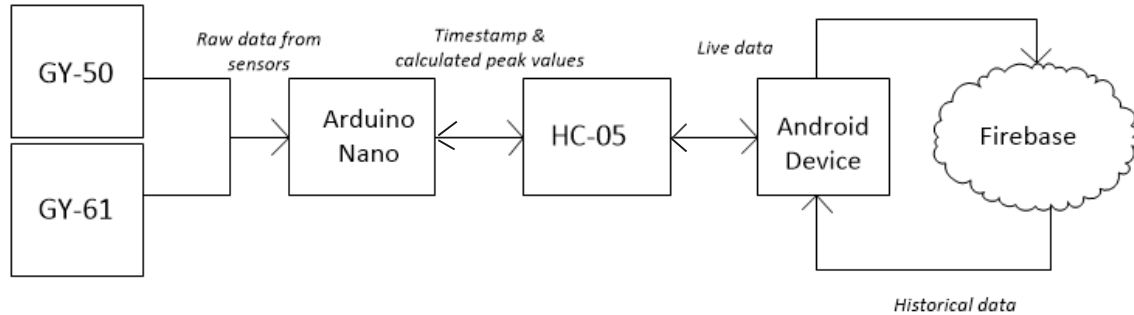
- Help people get active again
- During office hours
- Motivate them
- Track improvements



How

- Project Management tools (Jira)
- Development tools (Android Studio & Arduino IDE)
- Communication tools (Facebook/Discord)
- Version Control (GitHub)
- Shared Google Drive
- Guideline: The raw data from the sensors is calculated in the Arduino code, so it can be clearly presented in a graph for the user in the Android app.

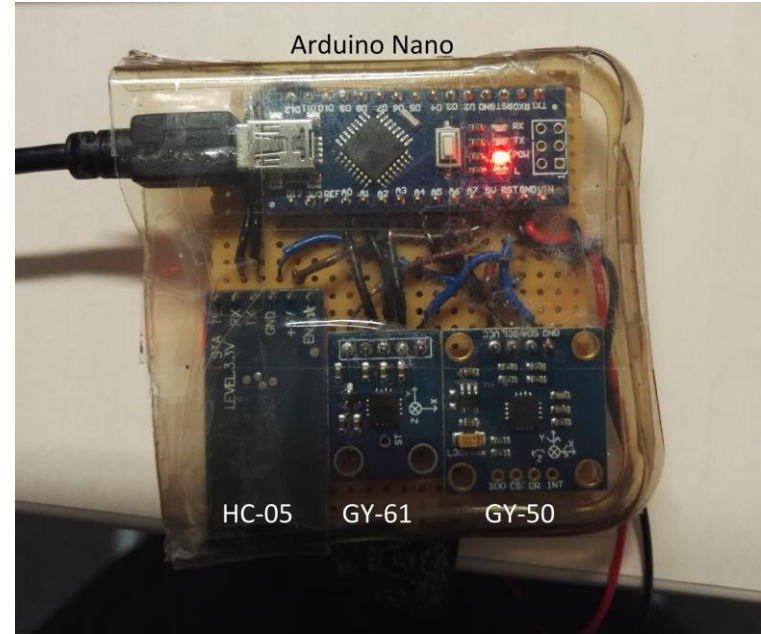
What: Hardware



The device consists of Arduino Nano microcontroller, GY-50 gyroscope, GY-61 accelerometer and a HC-05 Bluetooth module.

The actual device

- Arduino Nano
- HC-05 Bluetooth module
- GY-61 Accelerometer
- GY-50 Gyroscope





Hardware code

Up-down stretch:

Observe x-axis

Change state

Calculate angle using z-axis value

Send angle with time stamp via Bluetooth upon level change

```
Maximum = acceleration_x;
if (Maximum < 9.81)
{
    previouslocalMinimum = localMinimum;
    localMinimum = acceleration_z;
    if (previousMaximum < Maximum)
    {
        double UPvariable;
        double UPangle;
        double UPfoo = max (-9.81, localMinimum);
        UPvariable = asin(UPfoo / 9.81) / 3.14 * 180;
        if (UPvariable != 90.05){
            UPangle = UPvariable + 90;

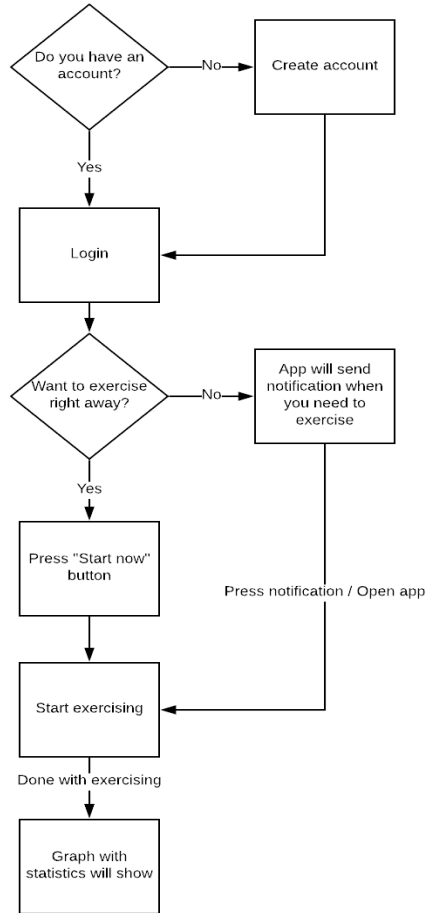
            if (BIGGESTangle < UPangle){
                BIGGESTangle = UPangle;
            }

            if (BIGGEST < BIGGESTangle){
                BIGGEST = BIGGESTangle;
            }
        }
    }
}
```



What: Software

- Native Android
- Firebase connection





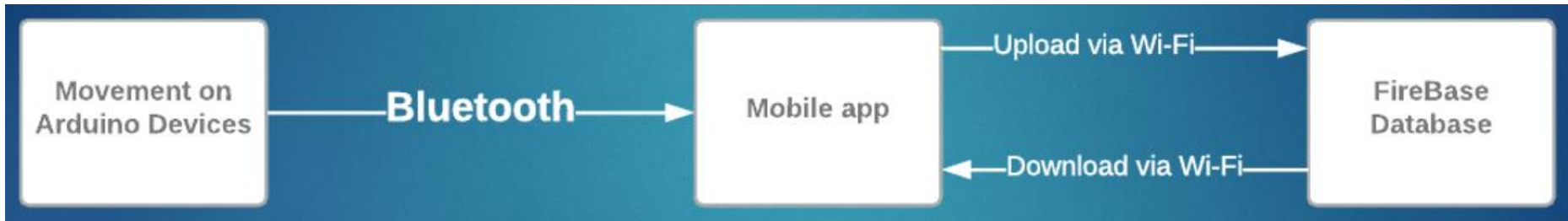
Advantages

- Easy to use
- Scalable
- Compact & lightweight
- Helps people get on the move again





Data Flow





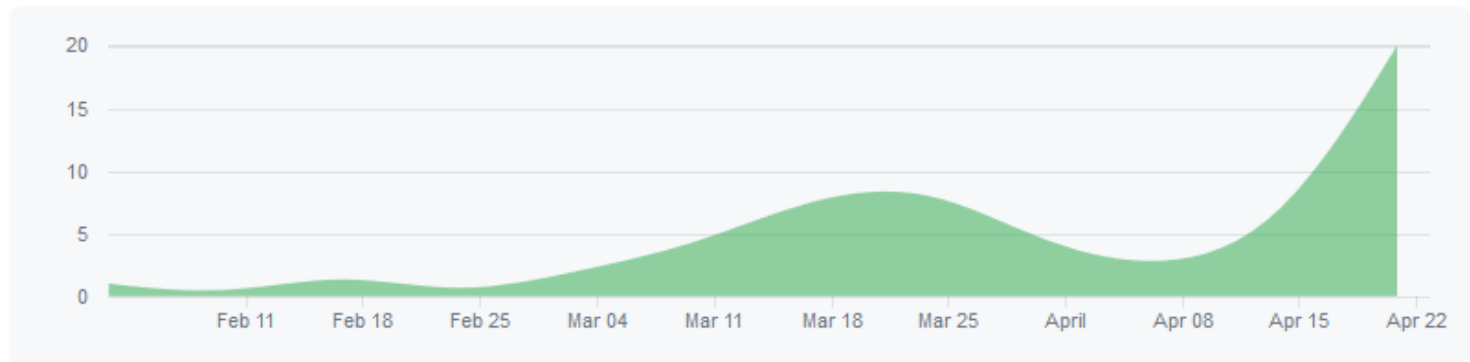
Demo

1. Power on the Stretchalyzer wrist apparatus
2. Open app + login
3. Make Bluetooth connection
4. Start exercise in app
5. Perform exercise



Looking back

- Rough start
- Lack in communication despite weekly meetings
- Great experience, learned lots of things





ANY
QUESTIONS
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