

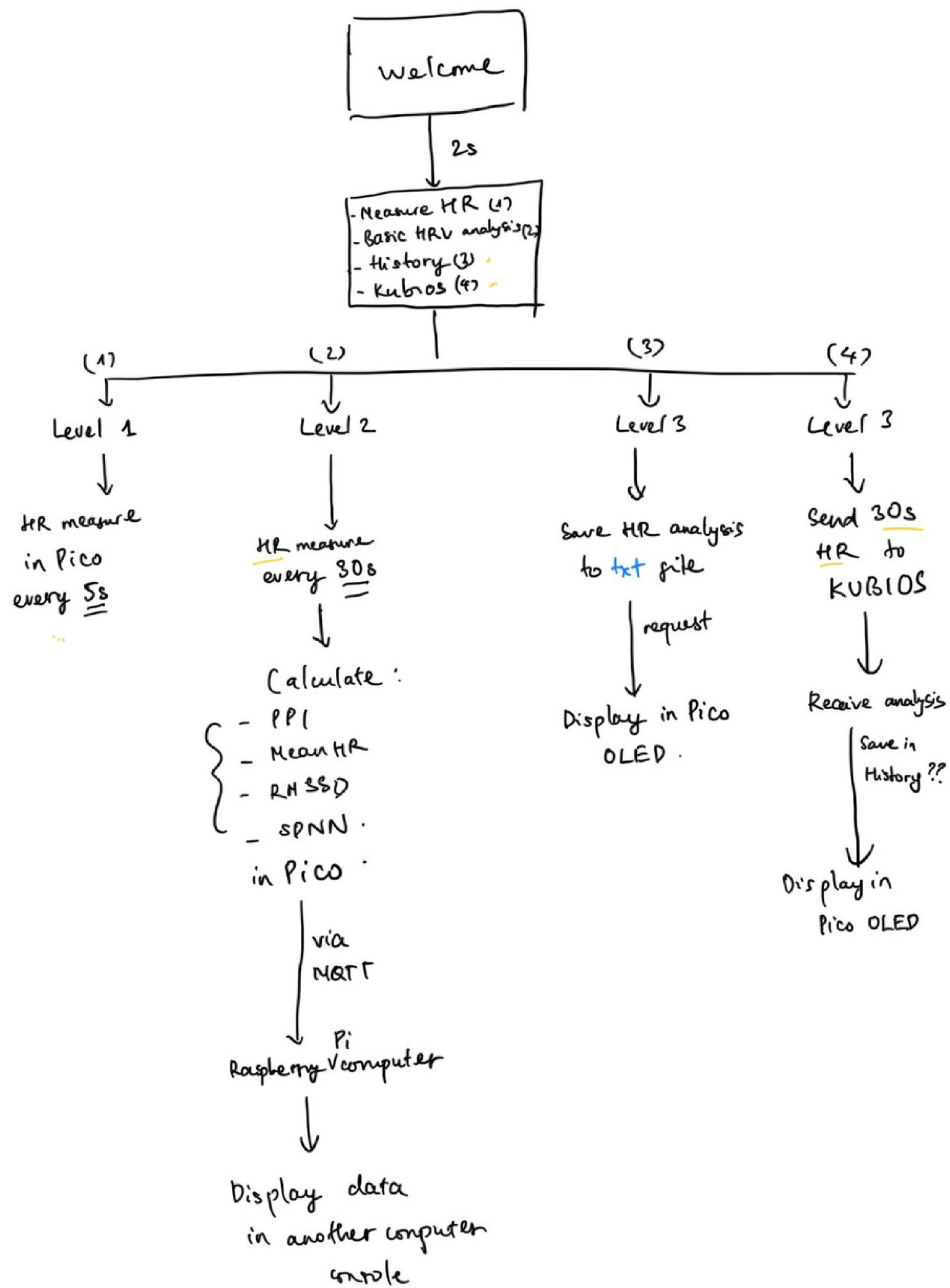
HEARTBEST PULSE OXIMETER

Hardware 2 Project
Group 2 - Nhut Vo, Tu Dinh

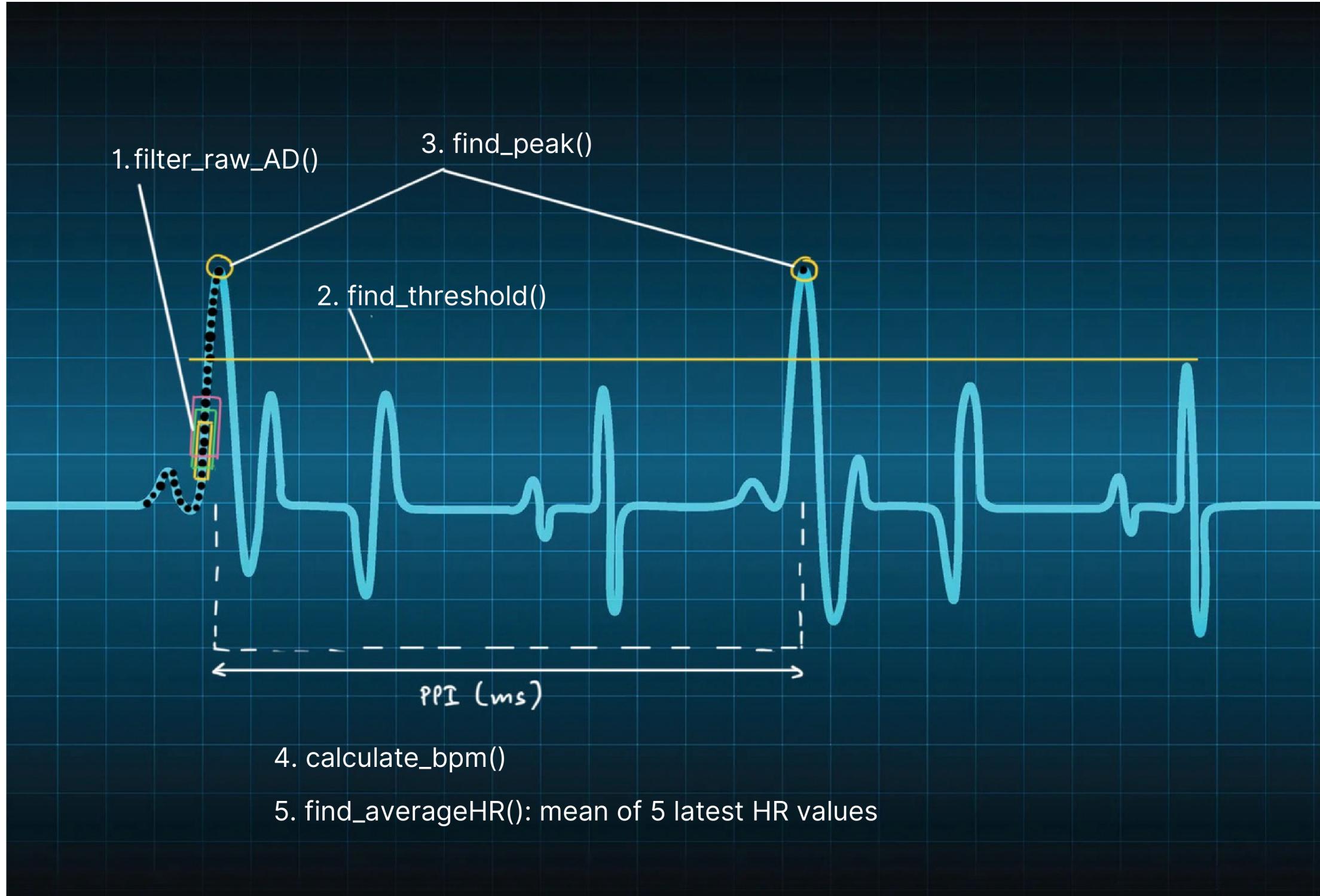
TOPICS

- 1 Goals and project framework
- 2 HR & HRV Algorithms
- 3 Main program of the system
- 4 Demo
- 5 Conclusion

Goals



HR & HRV ALGORITHMS



$$\text{Mean PPI } (\overline{PPI}) = \frac{1}{N} \sum_{n=1}^N PPI_n$$

$$\text{Mean BPM } (\overline{BPM}) = \frac{60000}{\overline{PPI}}$$

$$SDNN = \sqrt{\frac{1}{N-1} \sum_{n=1}^N (PPI_n - \overline{PPI})^2}$$

$$RMSSD = \sqrt{\frac{1}{N-1} \sum_{n=1}^{N-1} (PPI_{n+1} - PPI_n)^2}$$

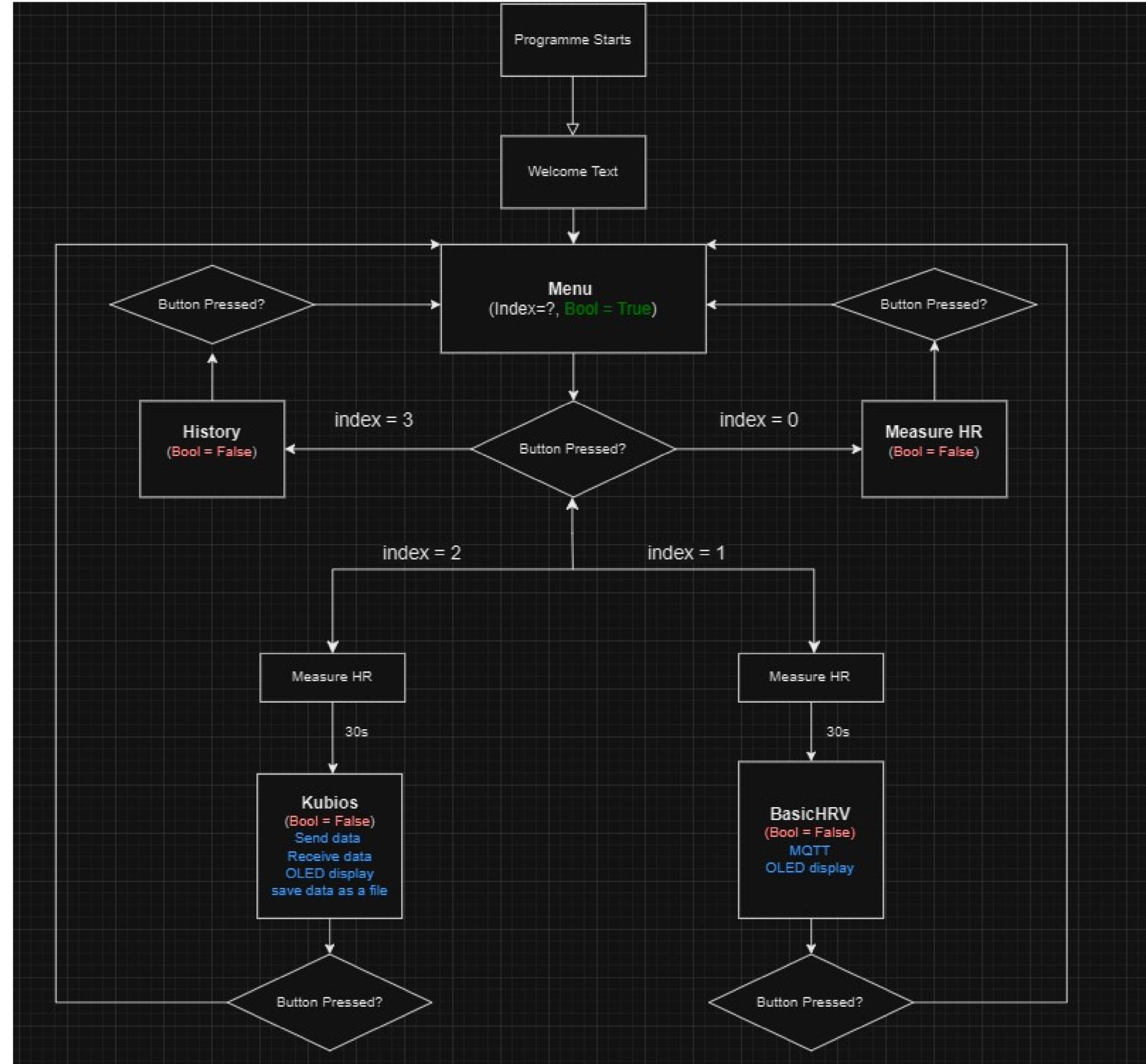


```
def SDNN(self):
    mean_ppi = self.meanPPI()
    sdnn_value = (sum((x - mean_ppi) ** 2 for x in self.PPIs) / len(self.PPIs)) ** 0.5
    return sdnn_value

def RMSSD(self):
    successive_diffs = [self.PPIs[i + 1] - self.PPIs[i] for i in range(len(self.PPIs) - 1)]
    squared_diffs = [x ** 2 for x in successive_diffs]
    mean_squared_diffs = sum(squared_diffs) / len(squared_diffs)
    rmssd_value = mean_squared_diffs ** 0.5
```

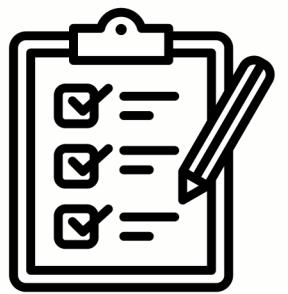
Class Heart_ADC

MAIN PROGRAM

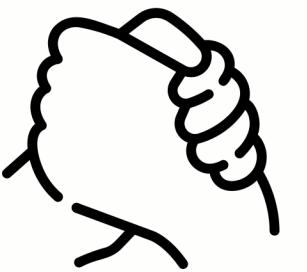


DEMO

Conclusion



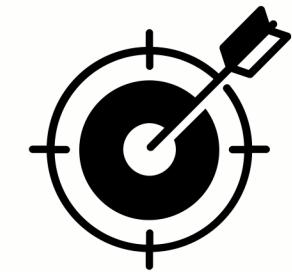
Project Assessment
Challenging due to heavy workload, no prior experience with hardware



Teamwork
Good collaboration with shared goals



Lesson learned
Project management skills



Overall Assessment
Successful project, requirements met for scale 5

Thank you for your attention!