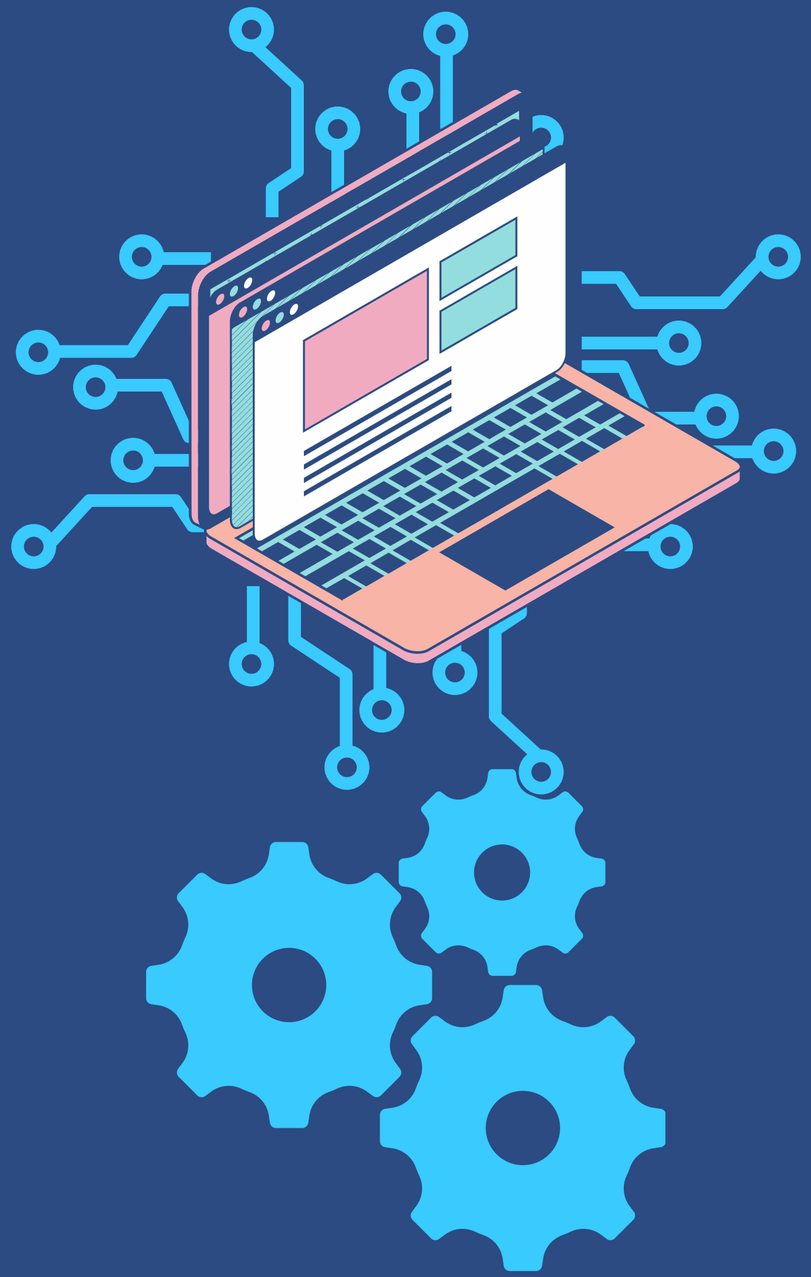
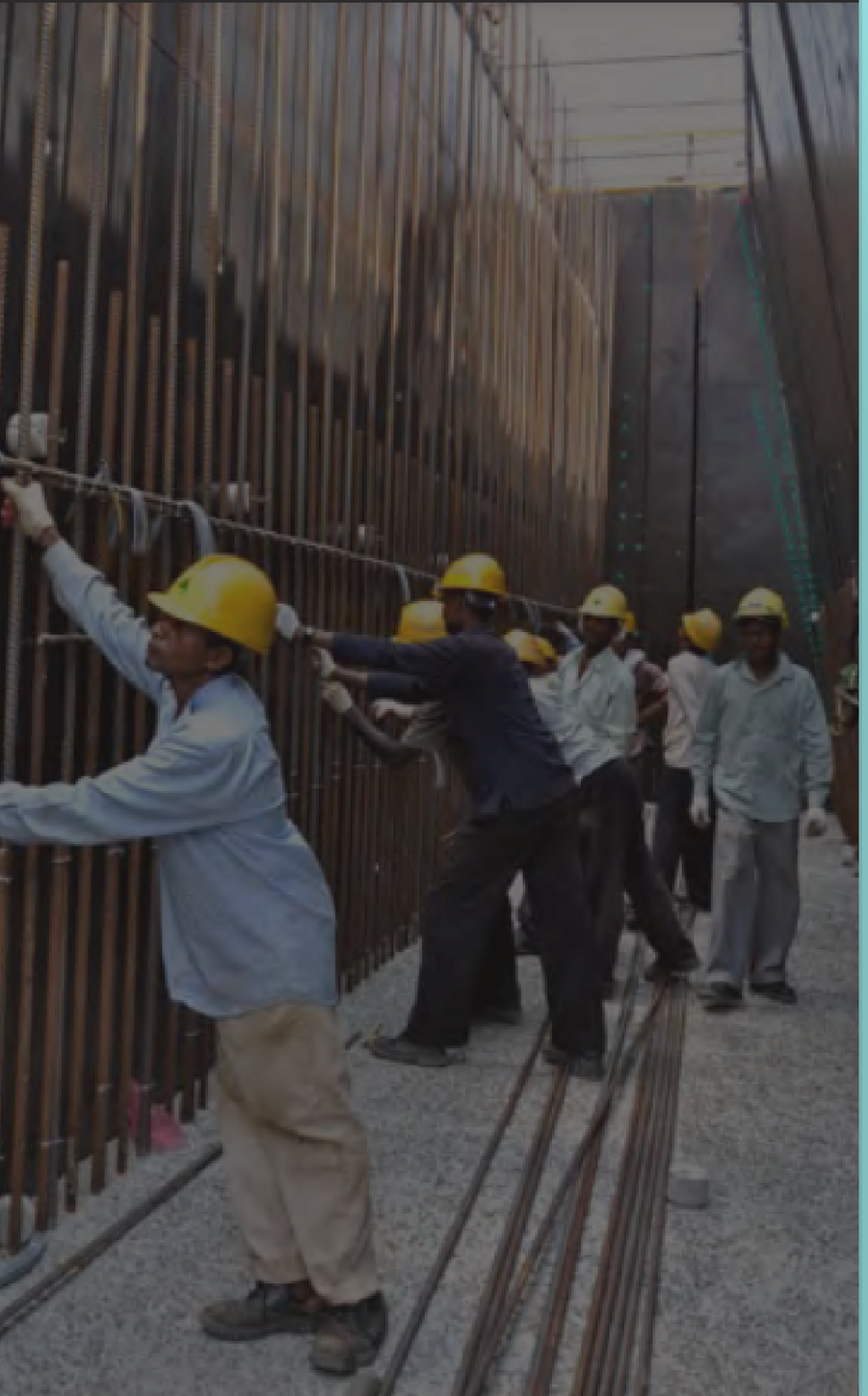


TEAM **BIT-DEVELOPERS** – PROGRESS REPORT

Smart Wearable for Workplace Safety

An IoT-powered wearable device for monitoring worker and workplace safety in industrial environments



MOTIVATION

WHY IT'S IMPORTANT...

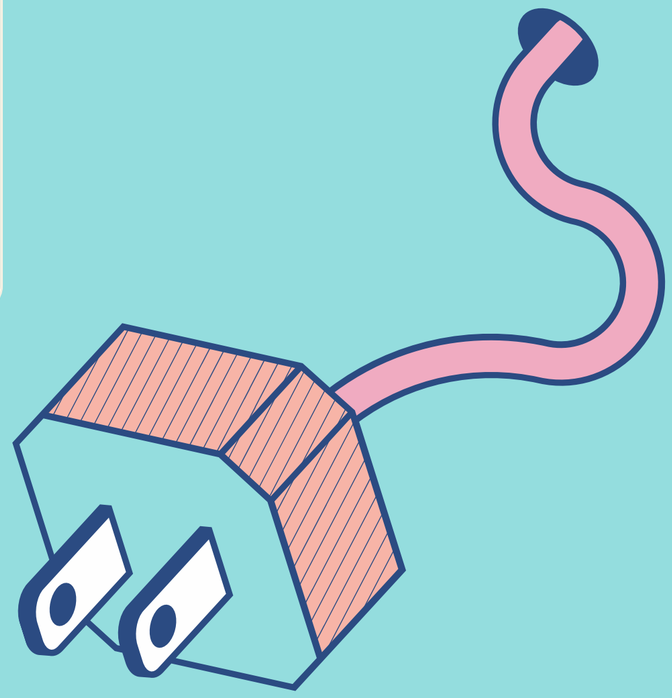
- Workplace safety is of critical importance
- Especially in places like Sri Lanka, where safety regulations and best-practices often go unheeded
- In Sri Lanka, nearly 4,000 workplace accidents are reported daily and nearly 600,000 productive, working-days are lost
- The main clause under the Occupational Safety & Health act of Sri Lanka covers only around 30% of the workforce.

It's clear that occupational safety and health is very often an under-rated concern of factory owners and employers across the Island

So, what's *our* solution...?

Reference: https://www.ilo.org/colombo/areasofwork/safety-and-health-at-work/lang--en/index.htm

A smart wearable for monitoring worker and workplace safety



- It should integrate seamlessly into the wearer’s daily-routine.
- It should be non-invasive
- It should send data wirelessly to a central data-collector (in this case, a MySQL database)
- It should facilitate real-time monitoring and be capable of warning the wearer in case of danger
- Should be durable and long-lasting even in industrial environments

Implementation Details

A BRIEF DESCRIPTION OF SOME IMPLEMENTATION DETAILS

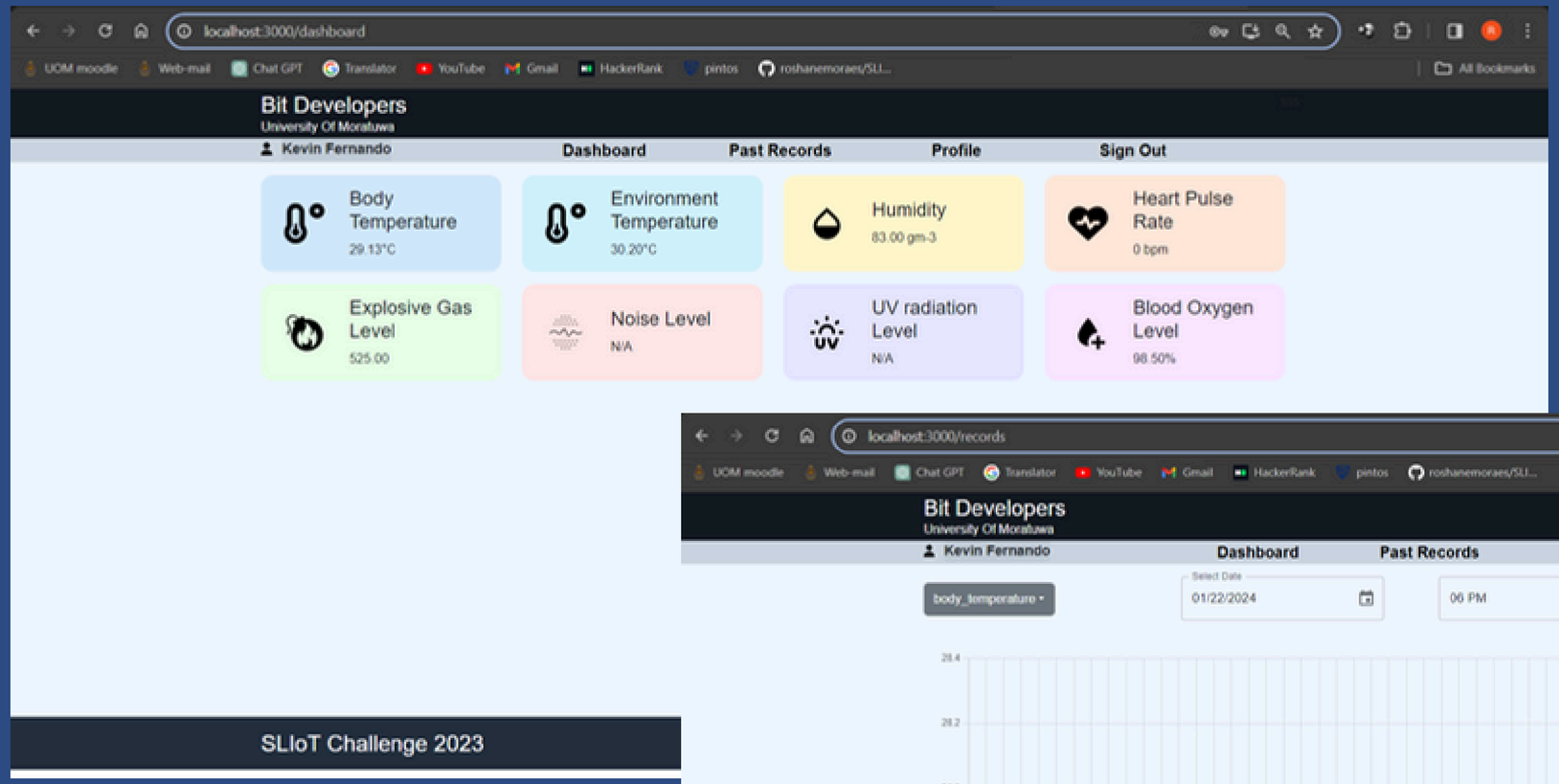
- For the prototype we use a NodeMCU board and connect several sensors for taking readings
- Each of the sensors' readings are sent to a MySQL database over a wireless network using the MQTT protocol. Our MQTT broker of choice was the Mosquitto broker
- The readings are sent to Node-Red, in which we define our workflows for the data
- From Node-Red, we insert the data into a MySQL database where it can be fetched by our website and used for further analysis
- Our intention is to make the wearable a modular device which allows for customization of the sensors as required by various unique industrial environments

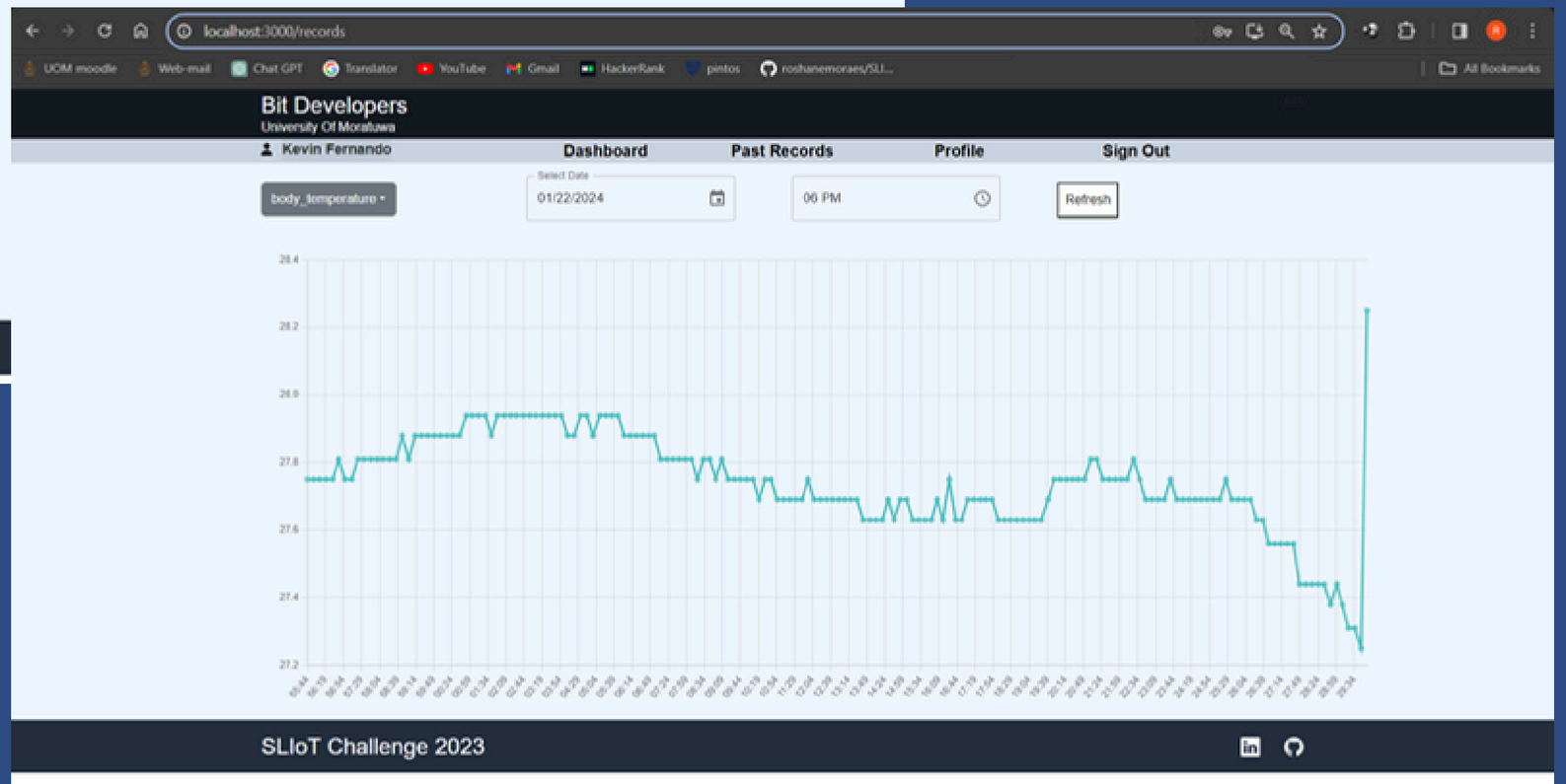
The Stationary Module

- In addition to the wearable device we can optionally build a stationary device which can include common sensors
- This will allow for more customization and flexibility while also reducing the cost
- If an anomaly or hazardous condition is detected, the workers in the specific area can be alerted by checking their GPS coordinates

Web-Interface

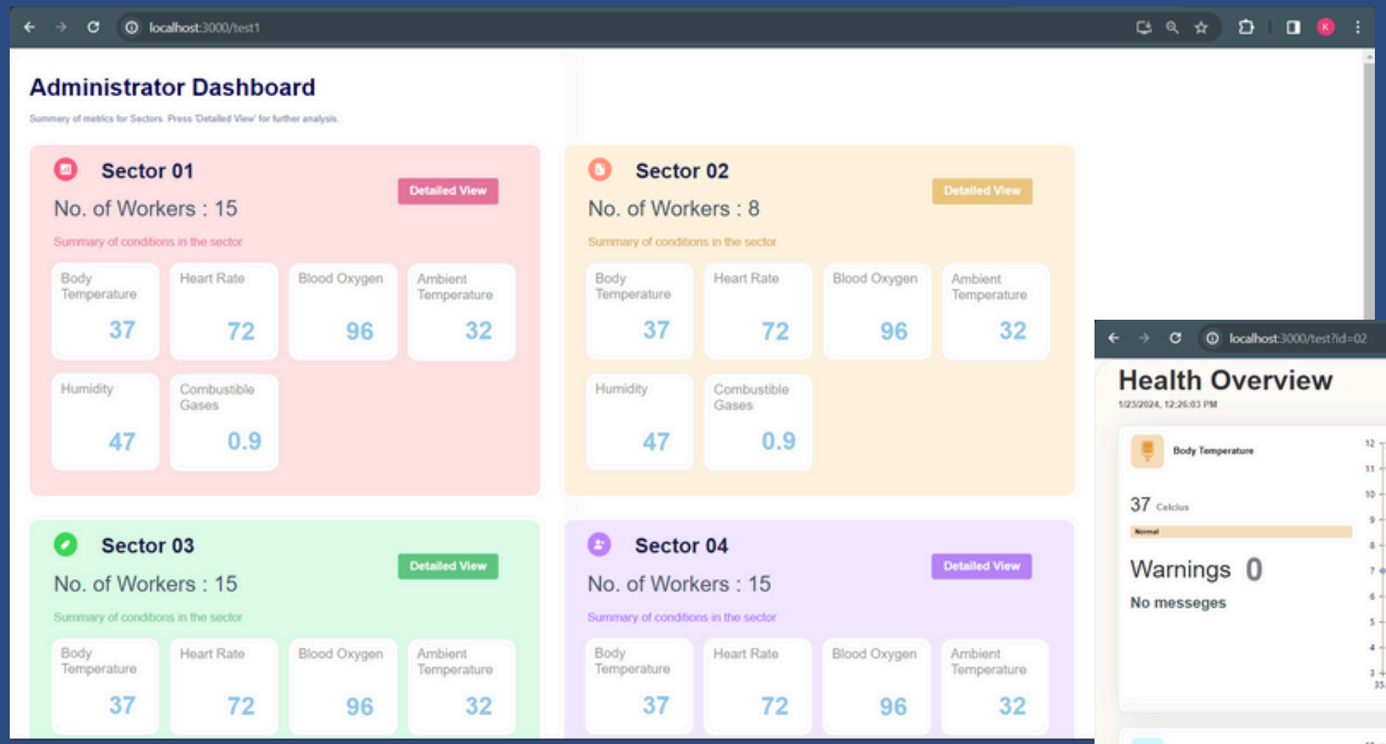
(FOR INDIVIDUAL WORKER)

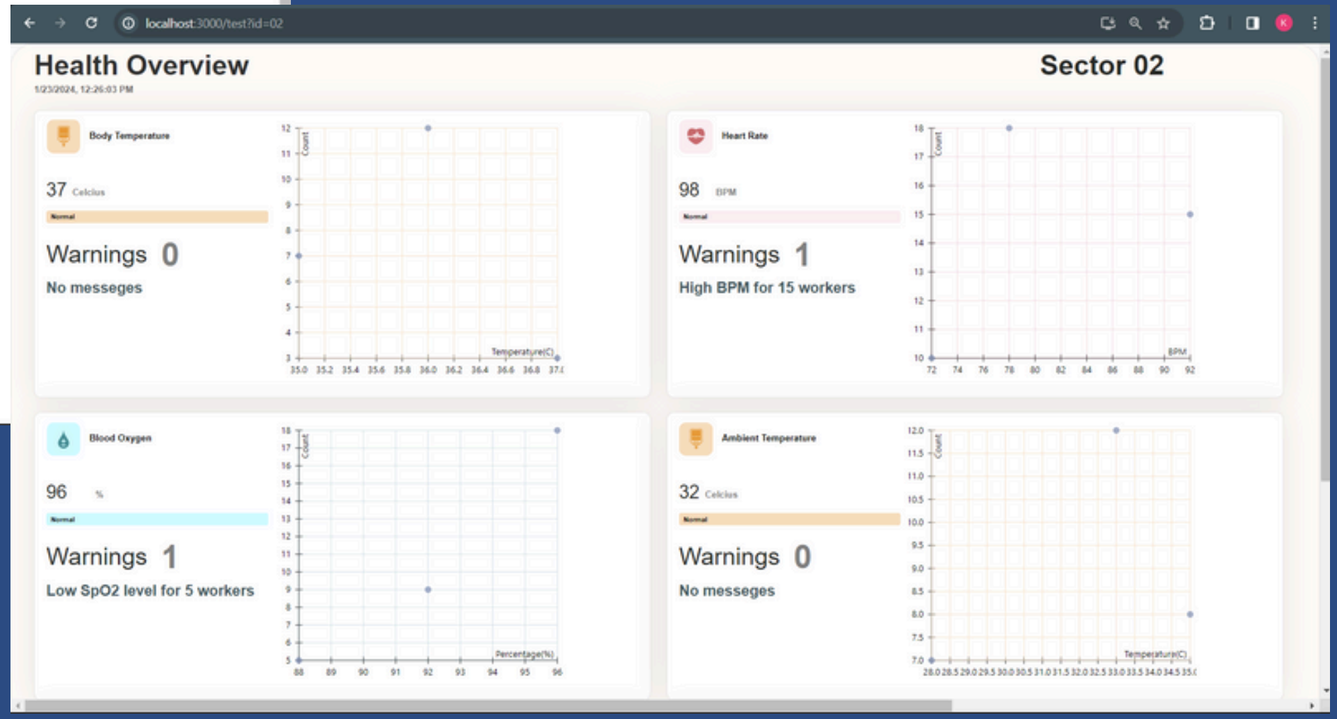




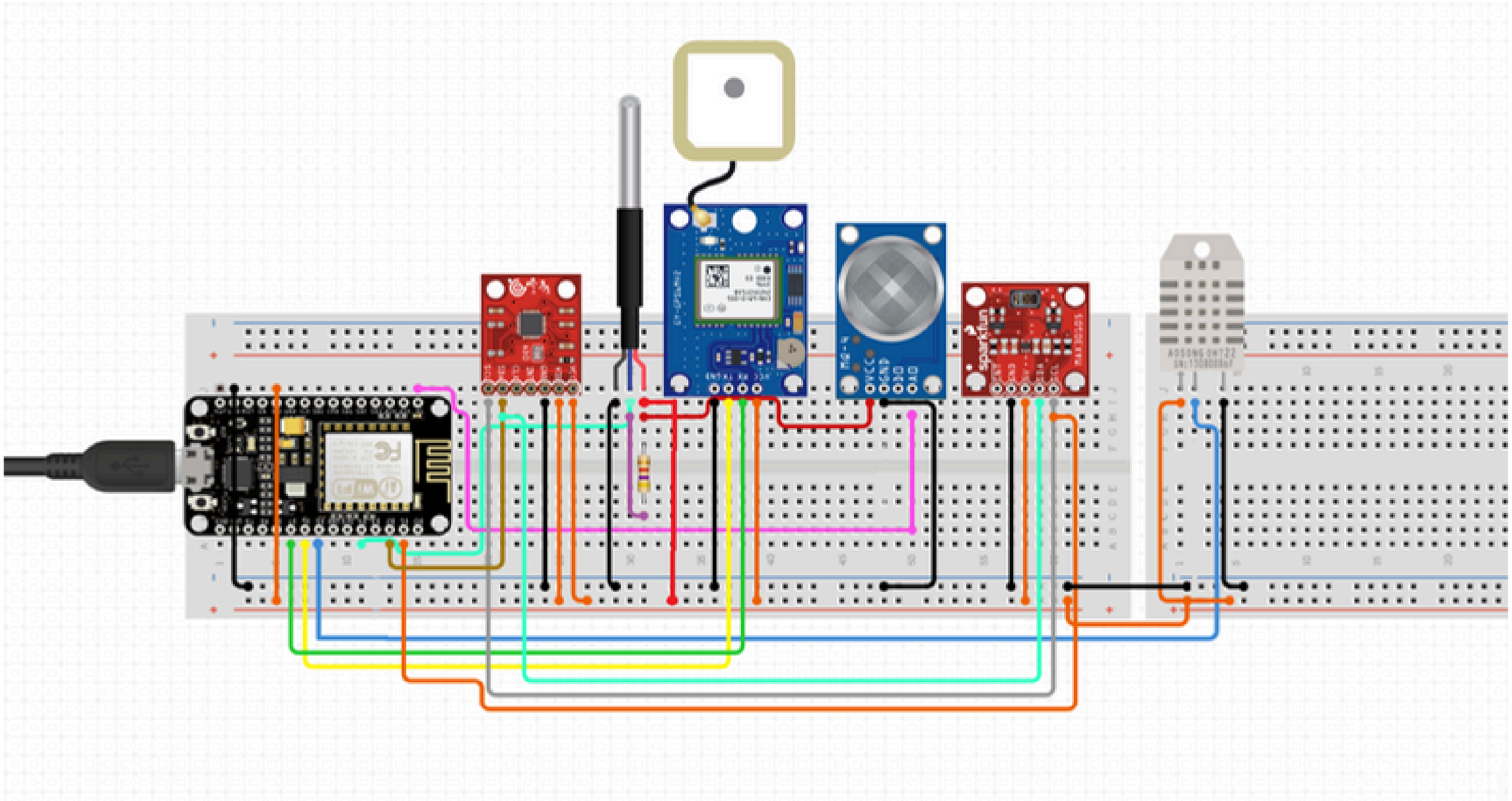
Web-Interface

(FOR ADMIN)





Circuit diagram for our wearable device prototype



VIDEO

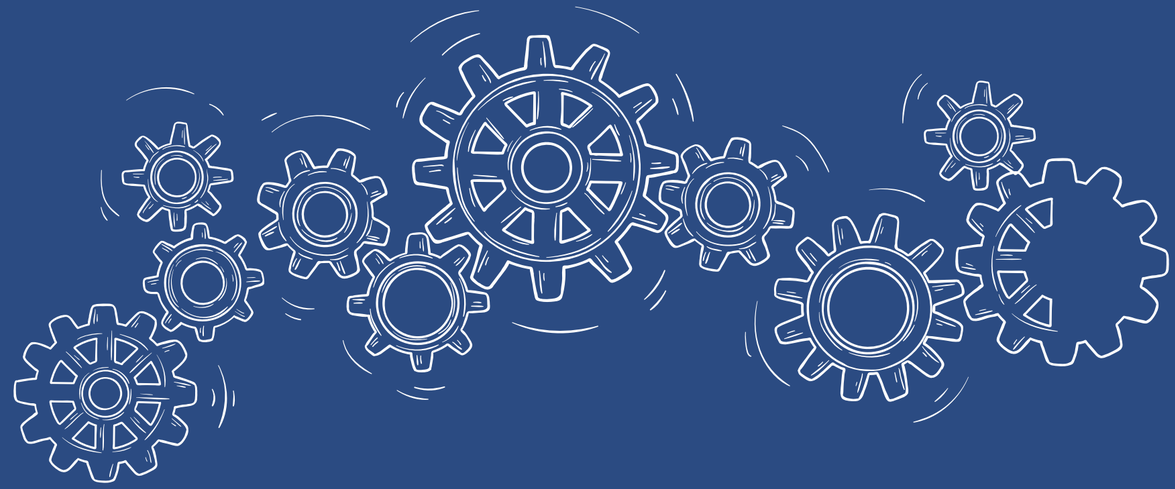
Progress

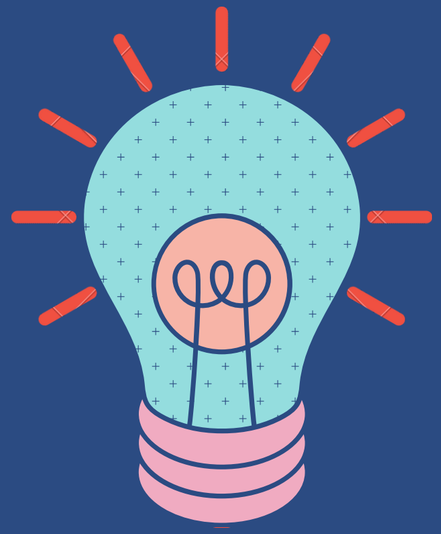
1	2	3	4	5	6	7	8	9	10
STEP	STEP	STEP	STEP	STEP	STEP	STEP	STEP	STEP	STEP
Research	Project plan	Build hardware prototype	Connect IOT devices with internet	Build web interface	Send data to web interface	Process data	Send signal to IOT devices from web	Build actual product	Testing and callibrating

COMPLTE

WORK IN PROGRESS

INCOMPLETE





Thank You!

TEAM BIT-DEVELOPERS