Prince Mohammad bin Fahd University

Department of Electrical Engineering

Learning Outcome Asse. III EE

Biomedical Glove

Student	ID
Aseel Alkhaldi	201501302
Walaa Alhawaj	201502759
Atika Alqunais	201601555

Advisor: Dr. Jawad Alasad

Outline

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- Project Objective and Specifications
- Project Architecture
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Project Definition

- A glove that measures important vital signs using multiple sensors, and determine whether it is normal or not.

Project Objective

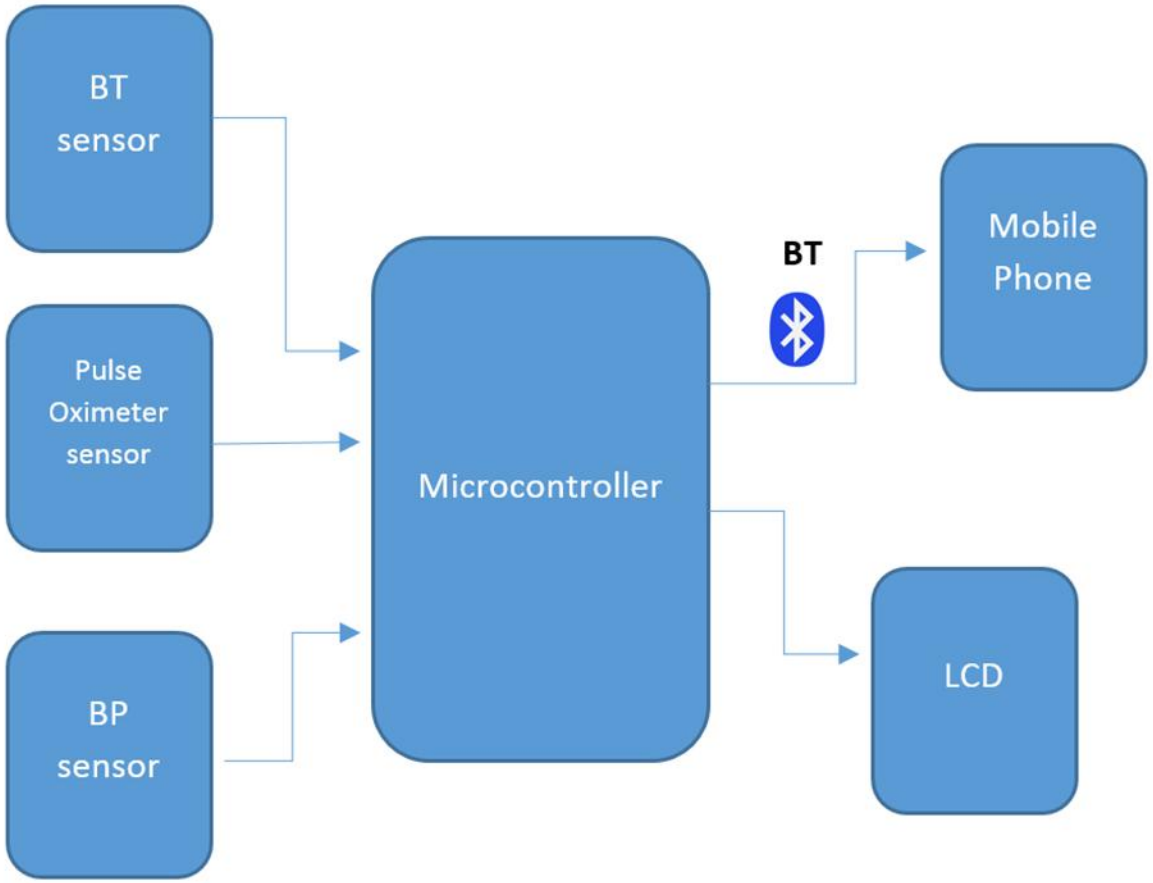
- Help people around the patient to have an initial diagnosis of the patient.

- Save patients life at early stages by calling doctor or take patient to hospital.

Project Specifications

- Measure body temperature
- Measure oxygen saturation and heart rate
- Measure Blood pressure
- Send the data to a mobile phone

Project Architecture



Background: Problem

- People often feel nervous, and stress gets to them when they witness a medical emergency. Especially if they were normal people with no medical background.

- When a person faints, it‘s hard to evaluate the situation without at least having readings of the basic vital signs.

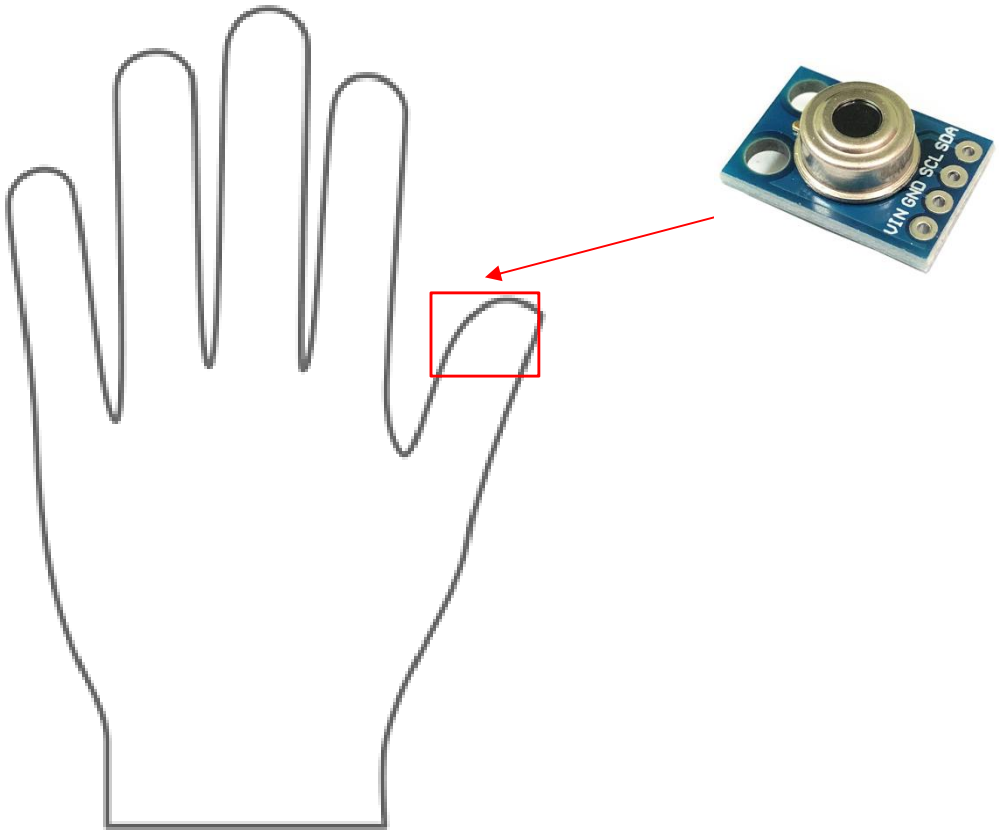
Background: Solution

- A Smart biomedical glove that measures vital signs
- It will help whoever is around the patient, to evaluate the situation until the arrival of the paramedics.
- Easy to use, accurate readings and available on first aid kit

Subsystems

Body temperature

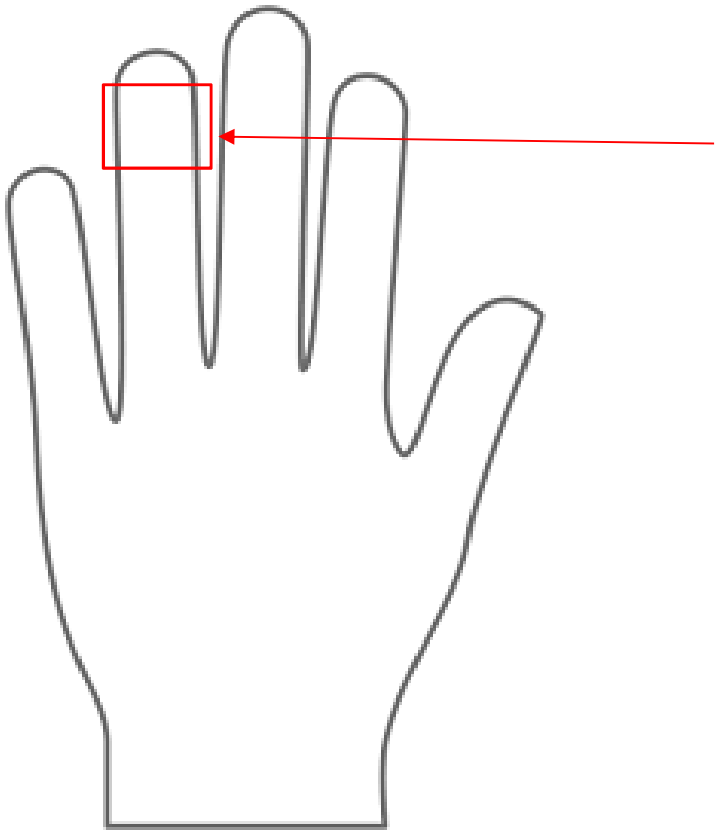
Measuring the temperature of the body using temperate sensor mlx90614



Subsystems

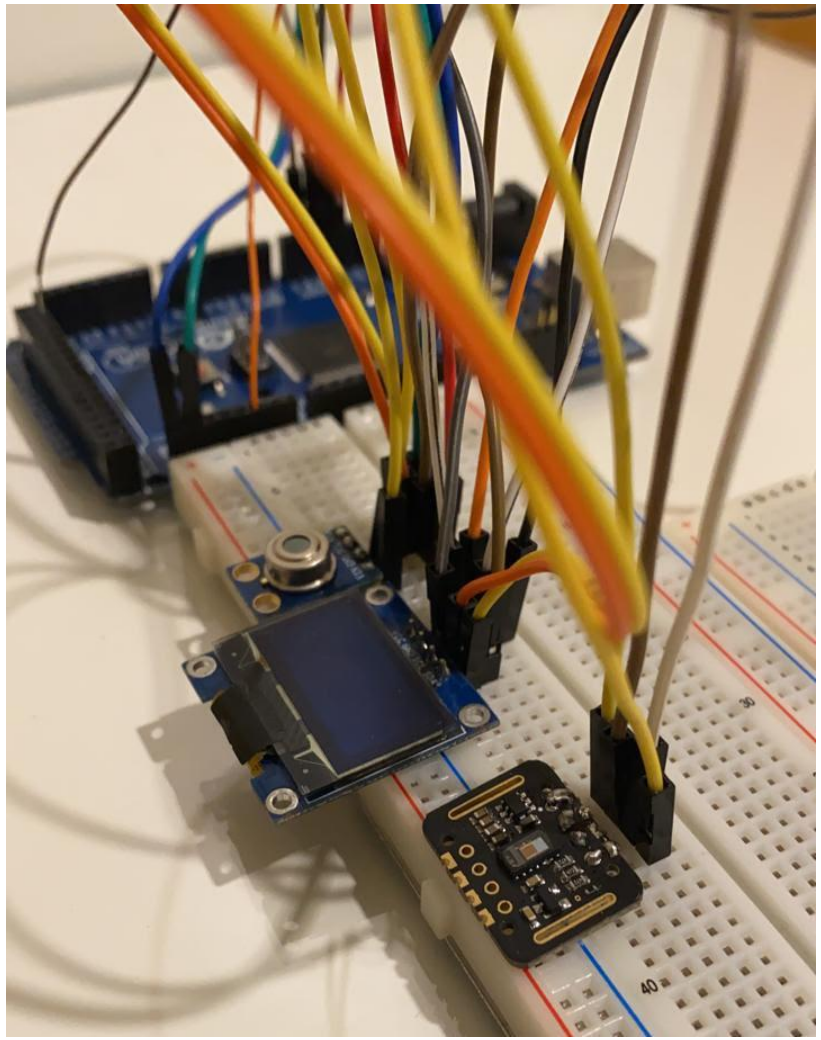
Heart rate & Oxygen saturation

Measuring HR and SPO2 using pulse oximeter sensor MAX30102



Progress

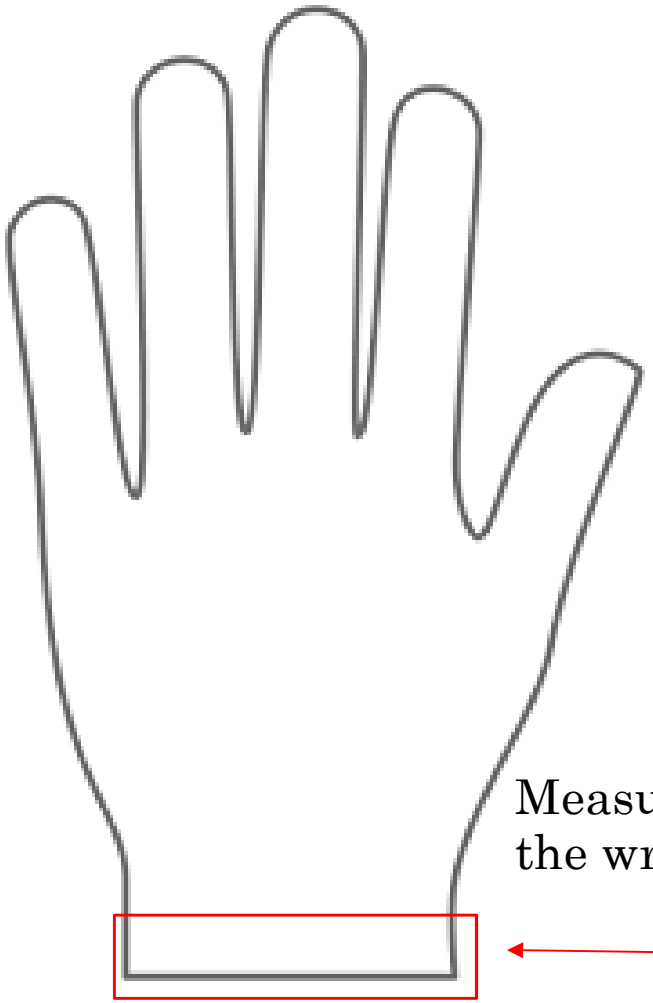
Demo I



Subsystems

Blood pressure

FESTNIGHT LCD Display Blood Pressure Monitor Wrist Pulse Meter Automatic Digital Pulsometer Sphygmomanometer



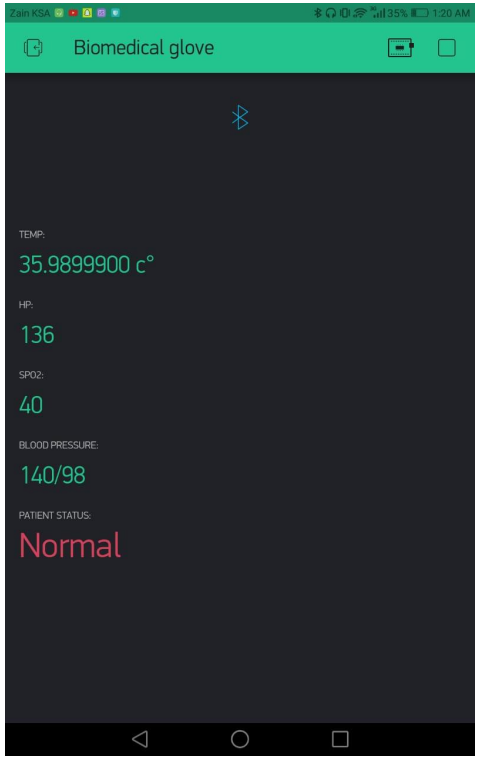
Measuring BP by blood pressure sensor placed around the wrist.

Subsystems

Bluetooth communication

Send the readings data to mobile phone,

and determine the patient status.



Planning

- **Test body temperature sensor**
- **Test pulse oximetry sensor**
- **Test blood pressure sensor**
- **Test Bluetooth communication**
- **Assemble all sensors together**

- **Time management to be done on time**
- **Set alternative solutions in case of facing any problem**

Risk assessment and management

- As a future recommendation, we decided to make it easier to reach in the future. But when we actually implemented the glove.

- The wires were missed up and were not easy to wear , so we decided to go to the future recommendation of ours even before we do the first prototype.

Impact of Covid-19

- Components shipping and delivering takes longer time than regular.
- Weak contact between group members comparing with regular attendance in university as before.
- Managing between online classes and attending university to work on project.

Budget Estimate

Item	Quantity	Unit Cost(SR)	Subtotal
Temperature sensor	1	44	44
Pulse oximeter	1	16	16
Blood pressure sensor	1	100	100
Bluetooth module	1	65	65
LCD	1	24	24
Microcontroller	1	70	70
Other components	-	200	
			Total: 519 SR

Survey

Are You a Health Practitioner?

31.5% Yes

68.5% No

N= 160

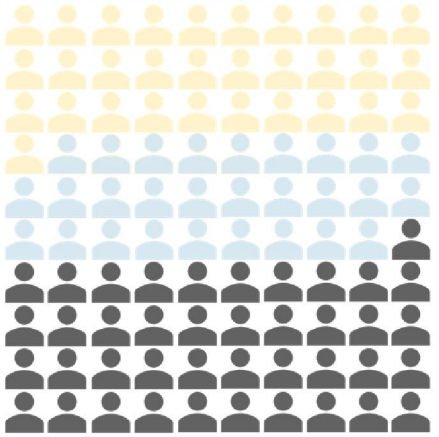
Have You Ever Witness a Medical Emergency?

36.4% Yes

63.6% No

N= 160

Was The First Aid Kit Sufficient?



31.5% Yes

25.3% No

N= 92 out of 160

Do You live With a Person Requiring Constant Health Care?

32.1% Yes

67.9% No

N= 160

Would You Prefer Using Bio Medical System That Measures All vital signs at once?

86.4% Yes

13.6% No

N= 160

References

- G. Ateş and K. Polat, "Measuring of oxygen saturation using pulse oximeter based on fuzzy logic," 2012 IEEE International Symposium on Medical Measurements and Applications Proceedings, Budapest, 2012, pp. 1-6, doi: 10.1109/MeMeA.2012.6226620.

- L. Atallah et al., "An ergonomic wearable core body temperature sensor," 2018 IEEE 15th International Conference on Wearable and Implantable Body Sensor Networks (BSN), Las Vegas, NV, 2018, pp. 70-73, doi: 10.1109/BSN.2018.8329661

- M. A. Abd El Ghany, M. S. Saleab, R. M. Toma, K. Hofmann, “Efficient Wearable Real-time Vital Signs Monitoring System” 2015 IEEE

Thank you

Any Questions?