# Automatic first aid in case of cardiac arrest with autonomous driving vehicle

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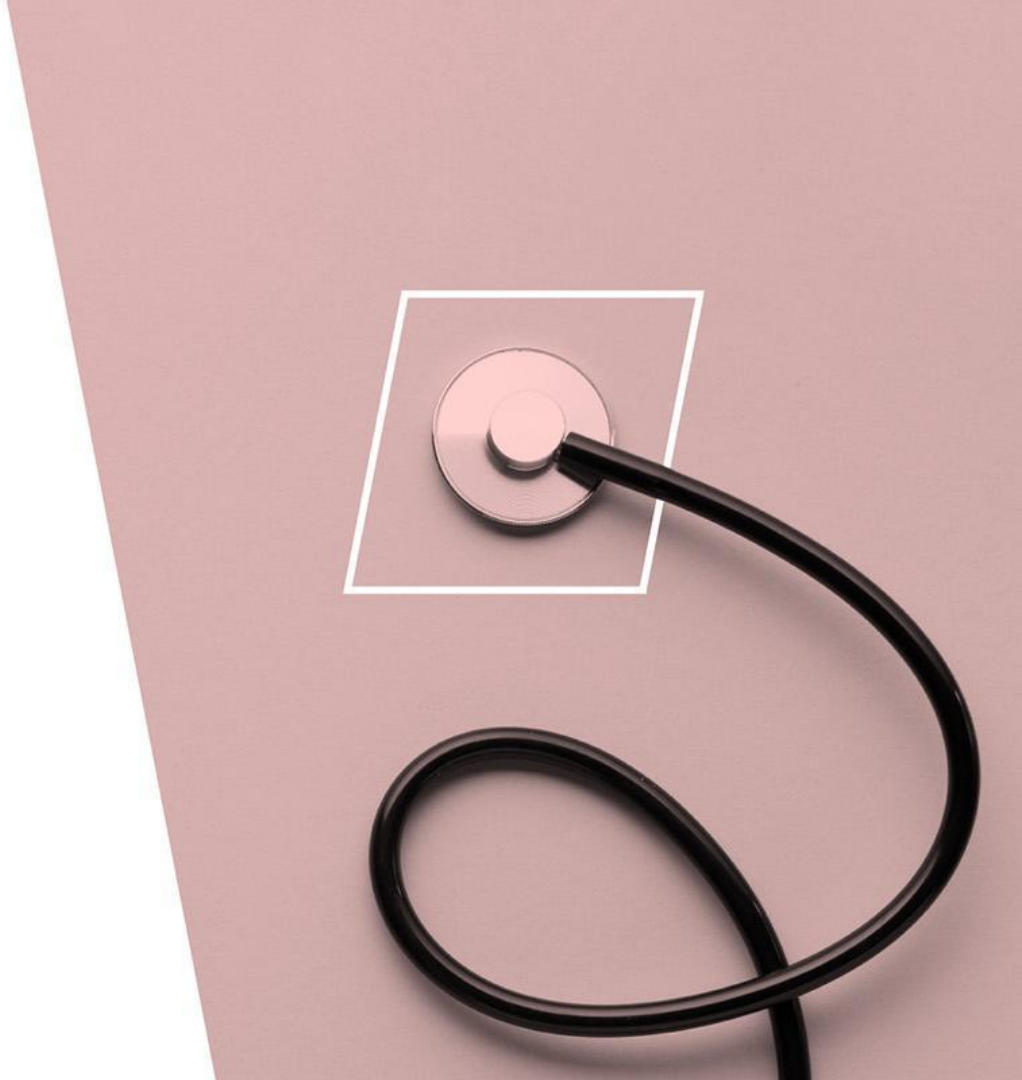
# 1

# INTRODUCTION

Introduce project with background and solution

# ABSTRACT

- An automatically emergency report in case of cardiac arrest
- Autonomous vehicles protect drivers and people around them
- Increase driver chances of survival



# 17 GOALS OF UNITED NATIONS

## GOOD HEALTH AND WELL-BEING

- **3.6** By 2020, halve the number of global deaths and injuries from road traffic accidents.
- **3.8** Achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe effective, quality and affordable essential medicines and vaccines for all.

# PROBLEMS

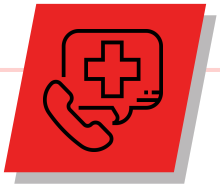
Driver cardiac arrest while driving

Can be a big accident

Increase in the elderly

Insufficient sleep

Work stress



Late emergency report

High probability of death

# SOLUTION

Cardiac arrest or loss of consciousness

Become a secondary accident

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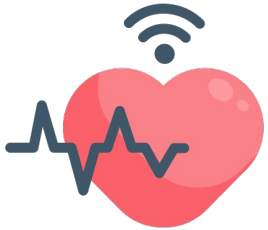
Automatically emergency report with driver's status and location

Automatically change autonomous driving and stop a safe place

# PRODUCTS



## VEHICLE

**Car (ECU)**
- Autonomous driving algorithm
- Camera
- Lidar sensor

## SERVER

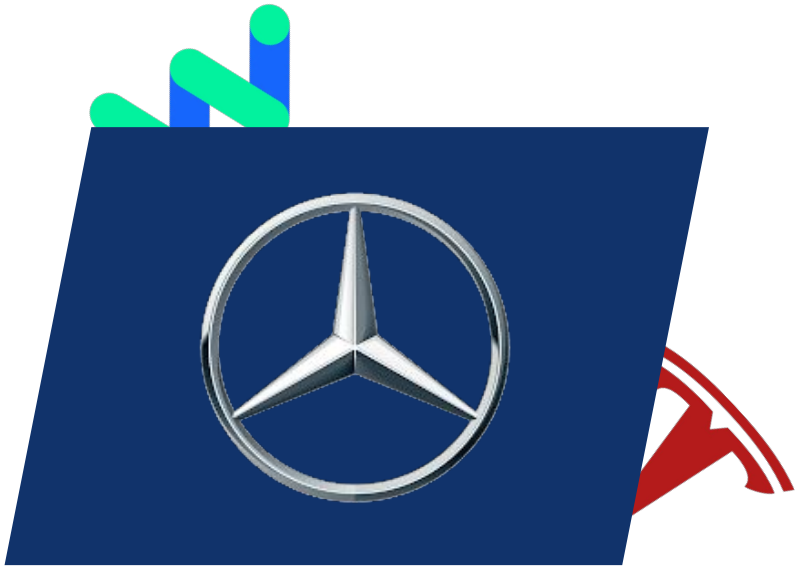
**Collecting server**
- Get IoT value
- Automatic emergency report
- Action according to the situation

## HEART RATE

**Heart rate monitor**
- Heart rate measurement
- Ask if low heart rate

# LEVEL 3 AUTONOMOUS VEHICLE

Mercedes-Benz has become the first automotive company in the world to meet the necessary requirements for approval of the Level 3 autonomous driving system. The approval has been granted by UN-R157 which is a United Nation regulation body that sets the standard of Level 3 autonomous driving technology in vehicles.



# 2

# DESIGN

Create architecture design before prototyping

# PROCESS

1. Literature review and study case
2. Planning and requirements analysis
3. Architecture Design
4. Develop application
5. Testing and deploy
6. Maintenance

# DESIGN LIST

## Use Cases

Overall system scenario

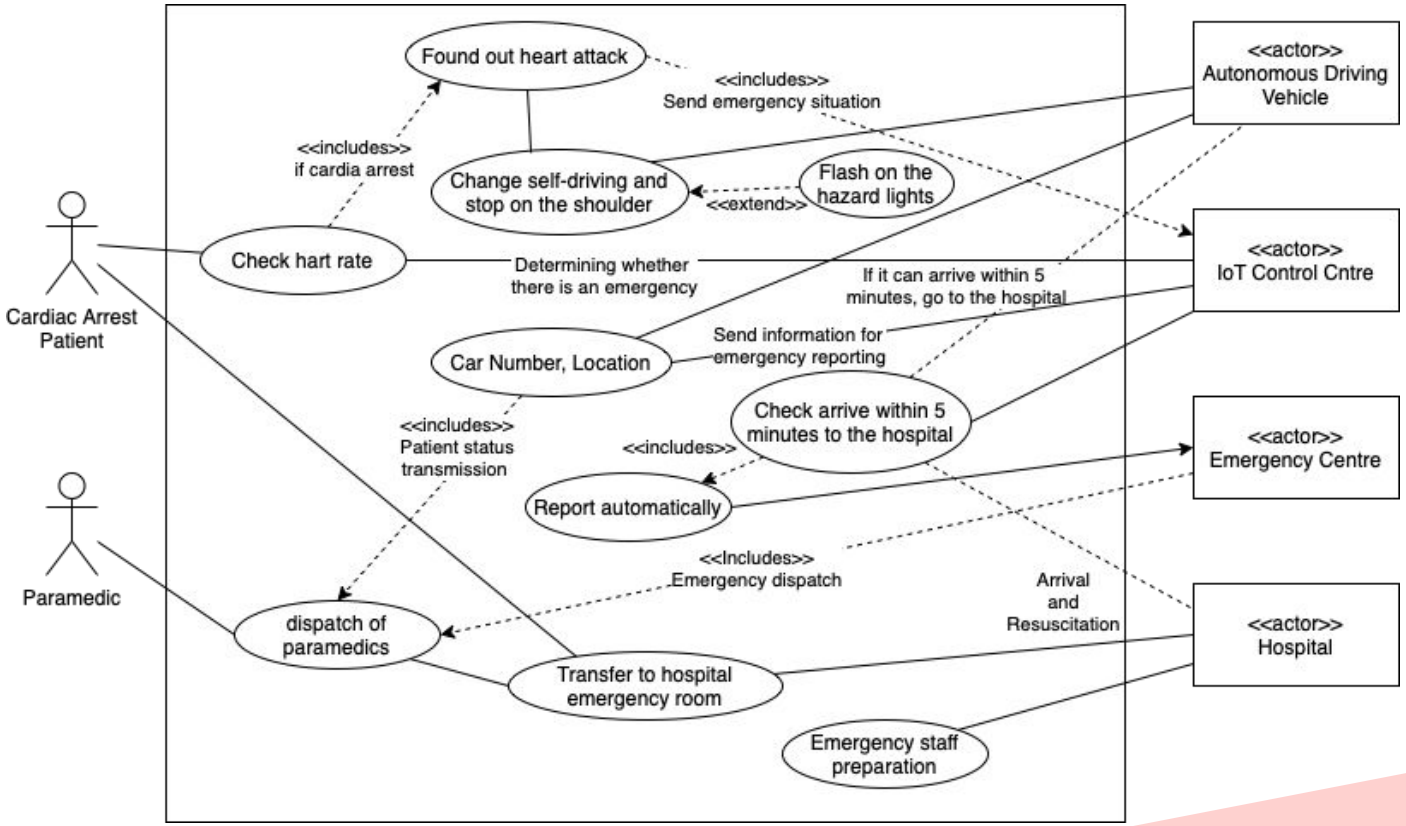
## Flowchart

Check application workflow and routine

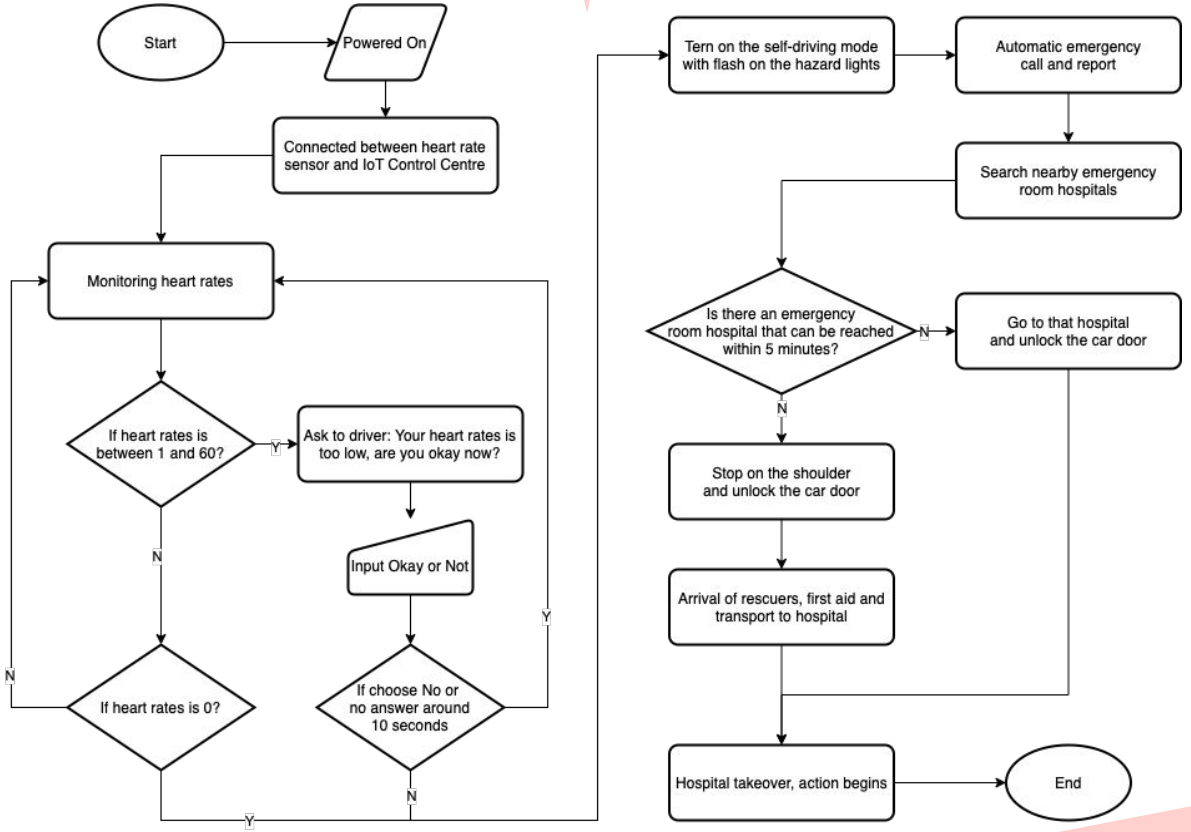
## Architecture Diagram

Check required products and system

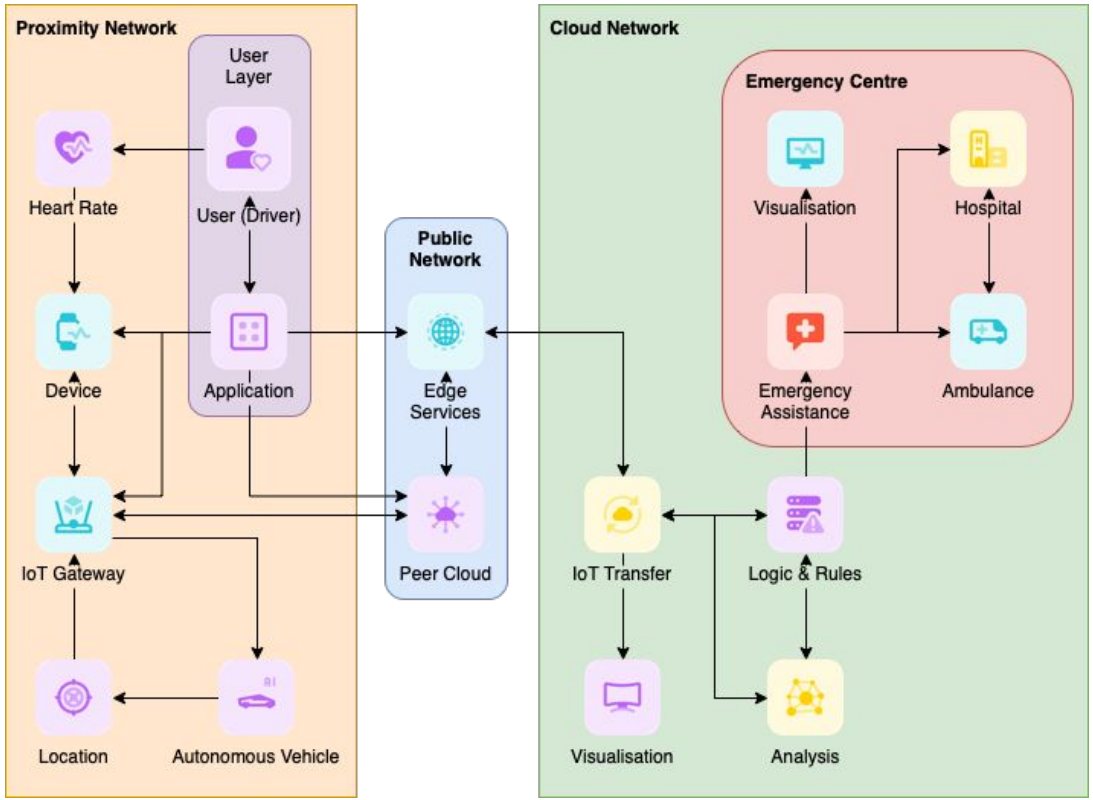
# USE CEASES


Found out heart attack
<<includes>>
Send emergency situation
<<actor>>
Autonomous Driving Vehicle
<<includes>>
if cardia arrest
Change self-driving and stop on the shoulder
Flash on the hazard lights
<<extend>>
Check hart rate
Determining whether there is an emergency
<<actor>>
IoT Control Cntre
Cardiac Arrest Patient
If it can arrive within 5 minutes, go to the hospital
Send information for emergency reporting
Car Number, Location
Check arrive within 5 minutes to the hospital
<<includes>>
Patient status transmission
<<includes>>
<<actor>>
Emergency Centre
Report automatically
Paramedic
<<Includes>>
Emergency dispatch
Arrival and Resuscitation
dispatch of paramedics
<<actor>>
Hospital
Transfer to hospital emergency room
Emergency staff preparation

# FLOWCHART


Start
Powered On
Connected between heart rate sensor and IoT Control Centre
Monitoring heart rates
If heart rates is between 1 and 60?
Y
Ask to driver: Your heart rates is too low, are you okay now?
Input Okay or Not
If choose No or no answer around 10 seconds
N
Y
N
If heart rates is 0?
N
Y
Tern on the self-driving mode with flash on the hazard lights
Automatic emergency call and report
Search nearby emergency room hospitals
Is there an emergency room hospital that can be reached within 5 minutes?
N
Go to that hospital and unlock the car door
N
Stop on the shoulder and unlock the car door
Arrival of rescuers, first aid and transport to hospital
Hospital takeover, action begins
End

# ARCITECTURE DIAGRAM

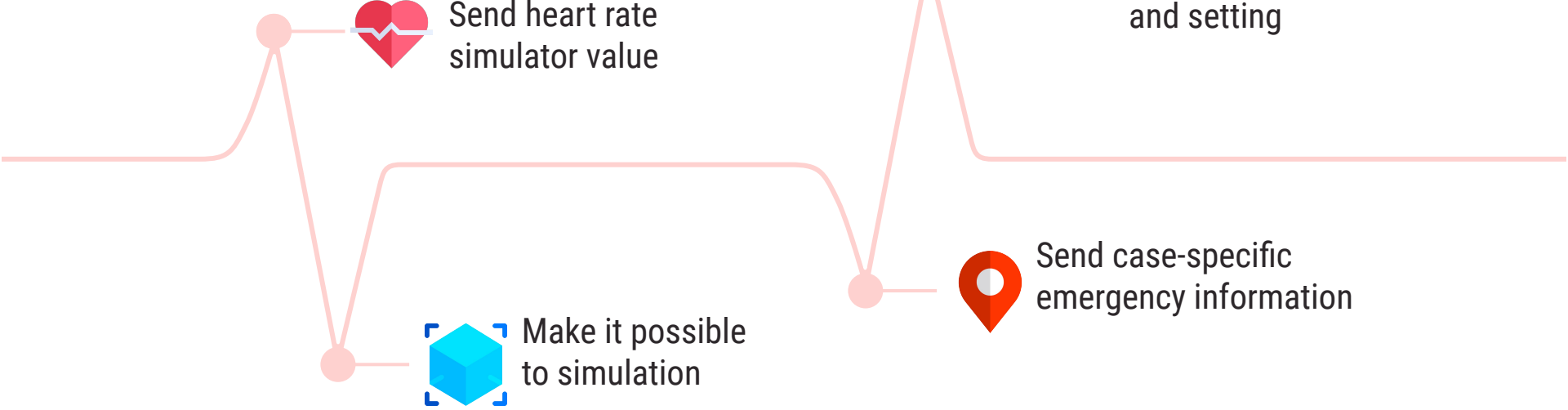


# 3

# PROTOTYPING

Develop prototype, demonstration and evaluation

# DEVELOPMENT



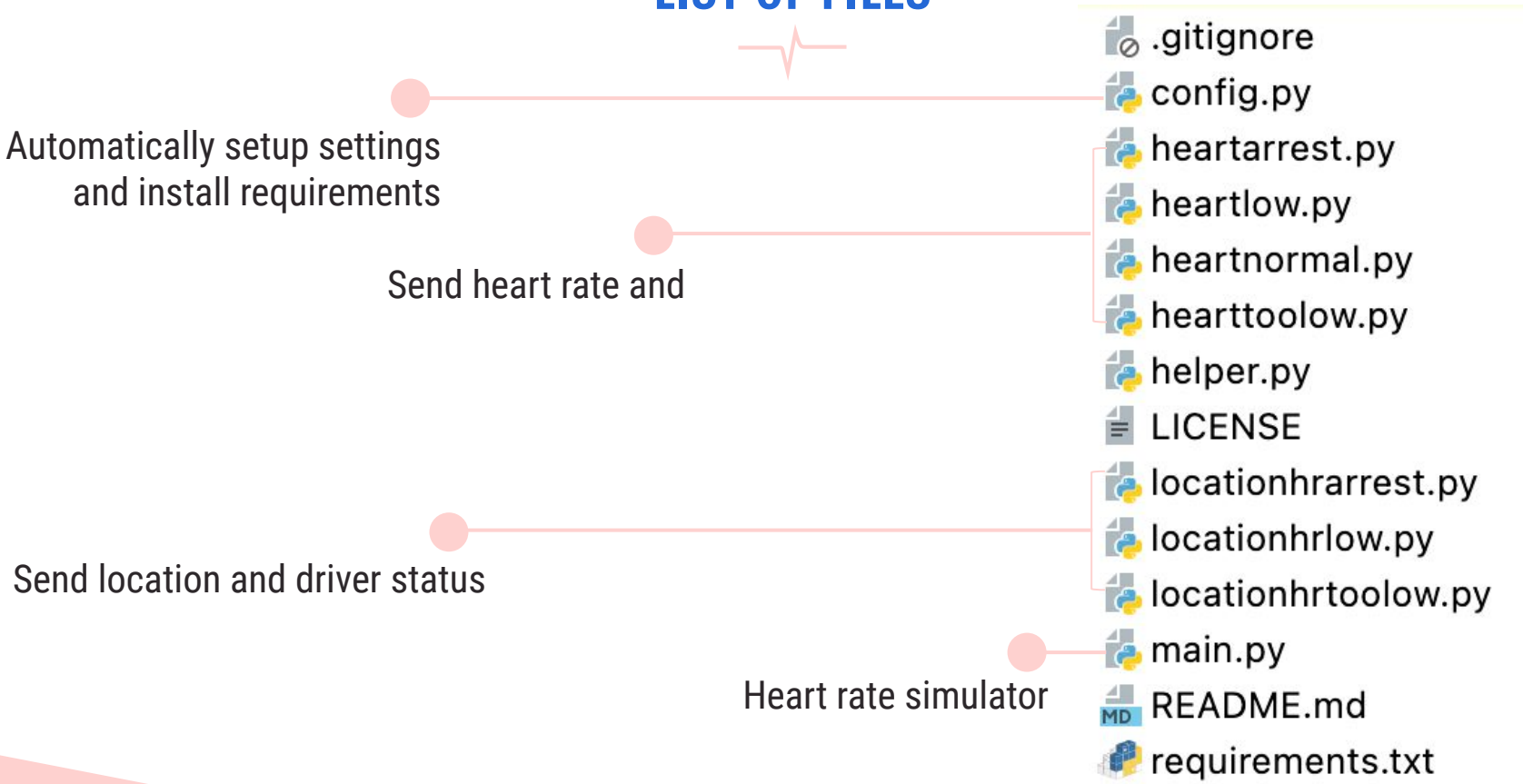
Send heart rate simulator value

Automatically configuration and setting

Make it possible to simulation

Send case-specific emergency information

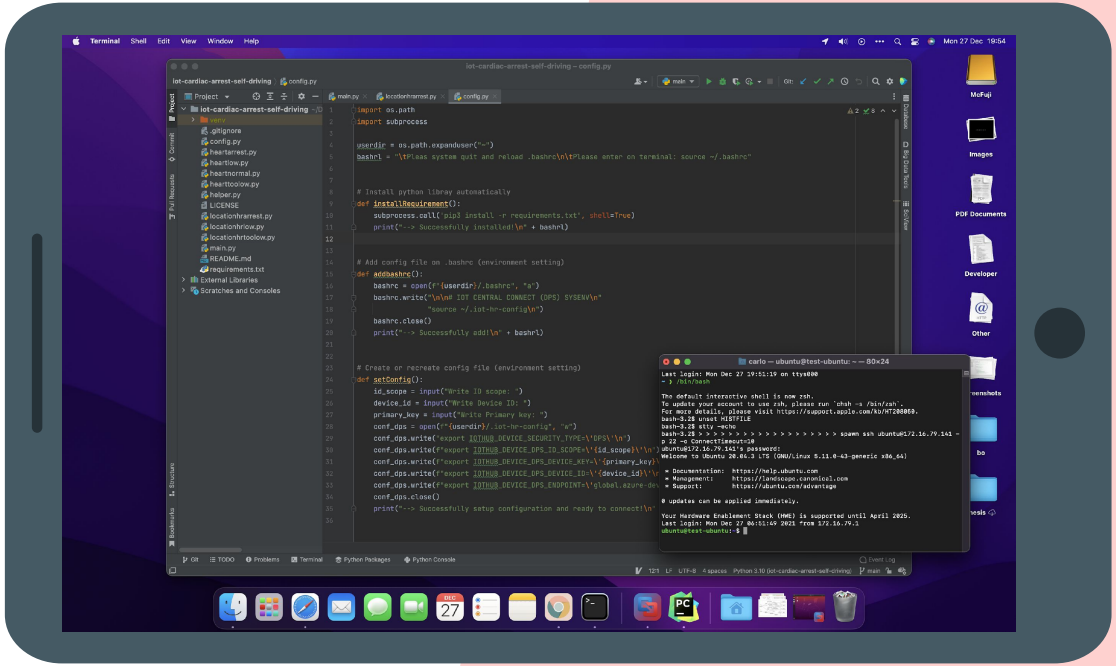
# LIST OF FILES



# DEMOSTRATION

## There're 4 simulation options

1. Normal heart rate
2. Low heart rate
3. Too low hear rate
4. Hear arrest



# EVALUATION

## PROS

Successful simulation operation according to each situation

## CONS

A more realistic simulation failed

# LACK PART

1. The full automation of the simulation failed
2. Simulation environment integrated
3. Missing the function to find nearby hospital

# 4

# CONCLUSION

Summary and organise the project

# CONCLUSION

Can create an opportunity
to save more people

Used PaaS effectively with IoT

# THANK YOU

The end of presentation

Do you have any question?