ChatGPT και Εφαρμογές AI για Ιατρούς

10th session – **Διαδίκτυο των Ιατρικών Συσκευών (Internet of Medical Things)**

UNIVERSITY OF THE AEGEAN

SCHOOL OF ENGINEERING

DEPARTMENT OF INFORMATION AND COMMUNICATION SYSTEMS ENGINEERING

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Cloud computing

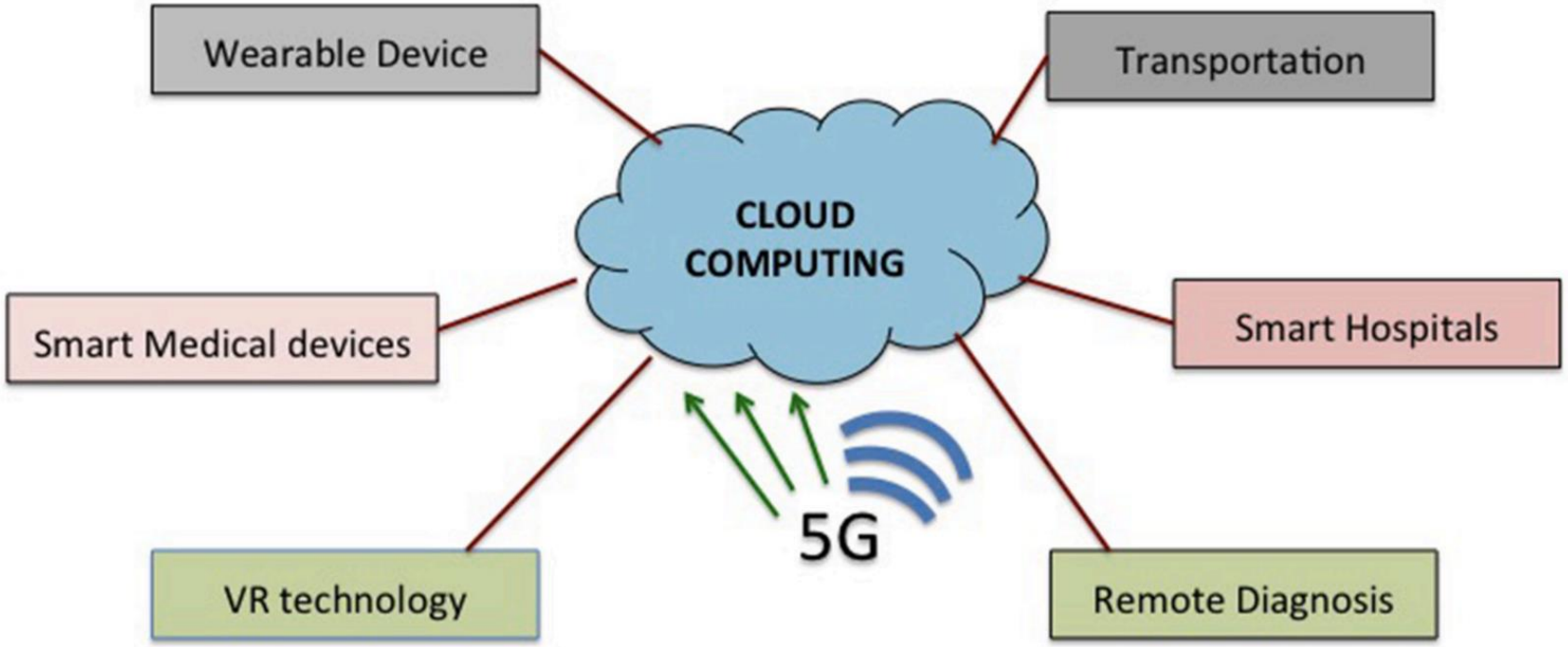
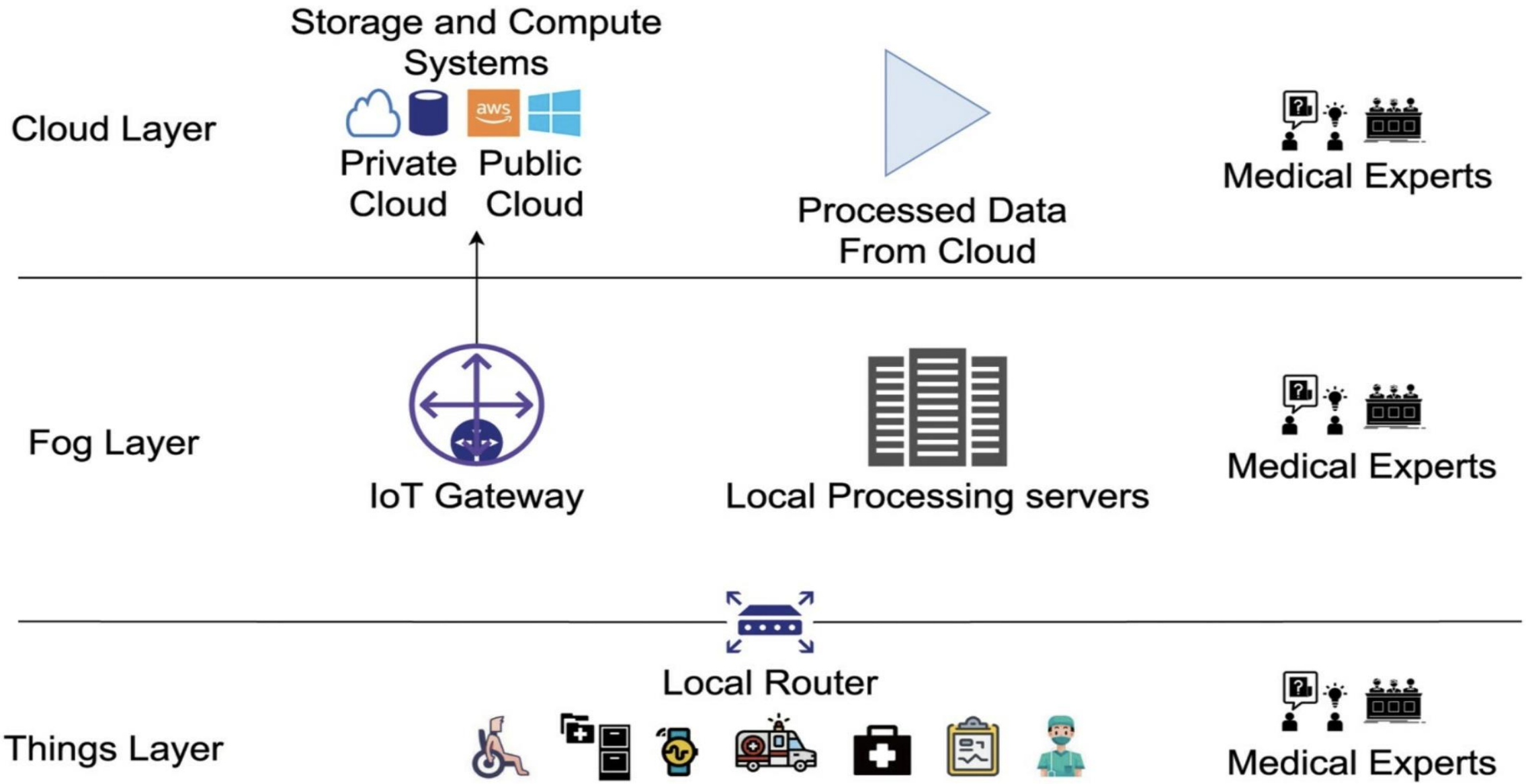


Fig. 5. Schematic representation of applications of 5G in healthcare.

Διαδίκτυο των Ιατρικών Συσκευών (Internet of Medical Things)



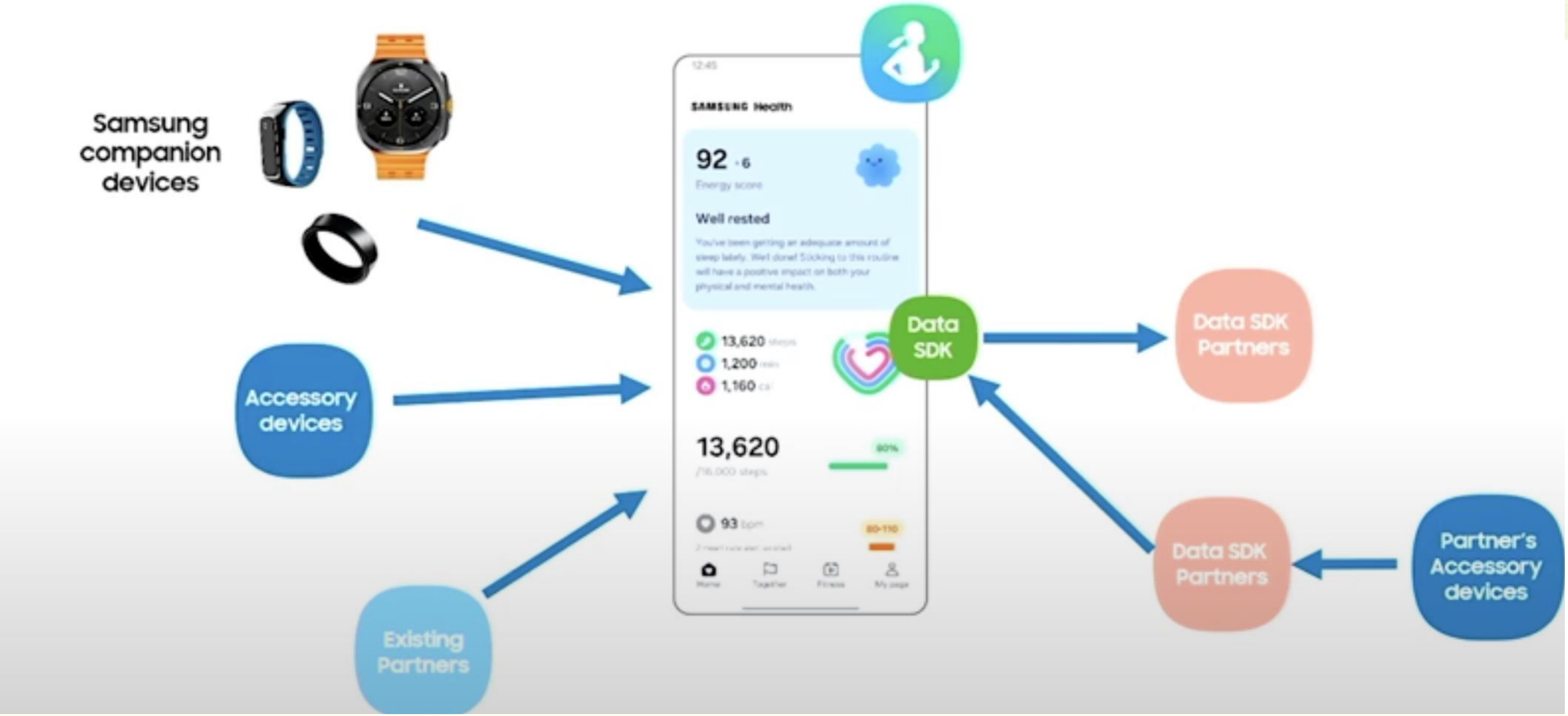
Internet of Medical Things (IoMT)

1. Αισθητήρες βιοσημάτων
Καρδιακός ρυθμός
Αναπνευστικός ρυθμός
Κορεσμός οξυγόνου,
Θερμοκρασία
Συστολική Αρτηριακή πίεση
2. Αισθητήρες δραστηριότητας
Επιταχυνσιόμετρο
Δέκτης GPS
3. Αισθητήρες περιβάλλοντος

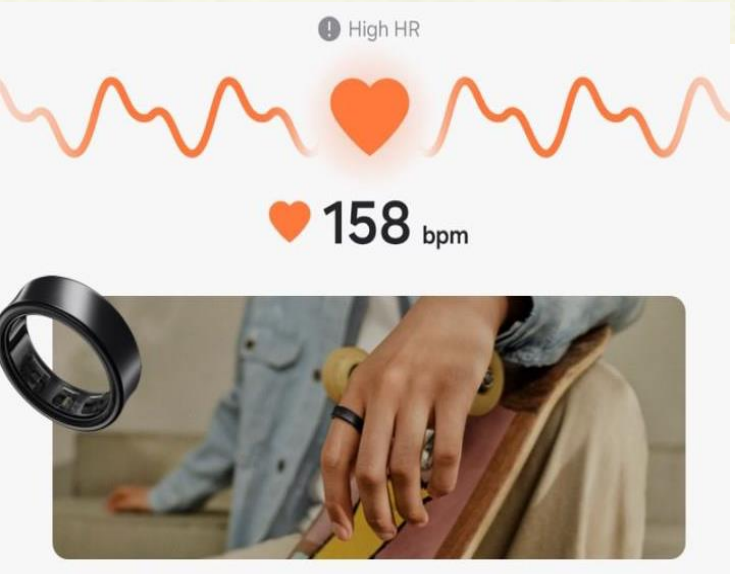
Figure 11 Vital signs monitoring through the web application.

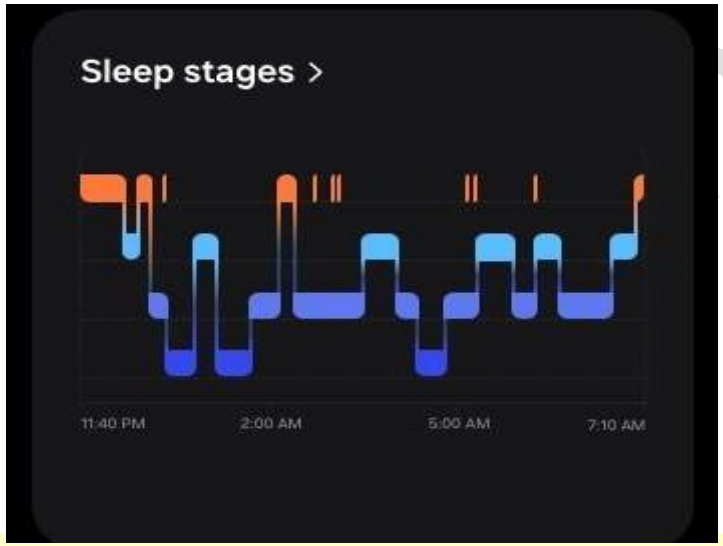
Samsung Health Ecosystem

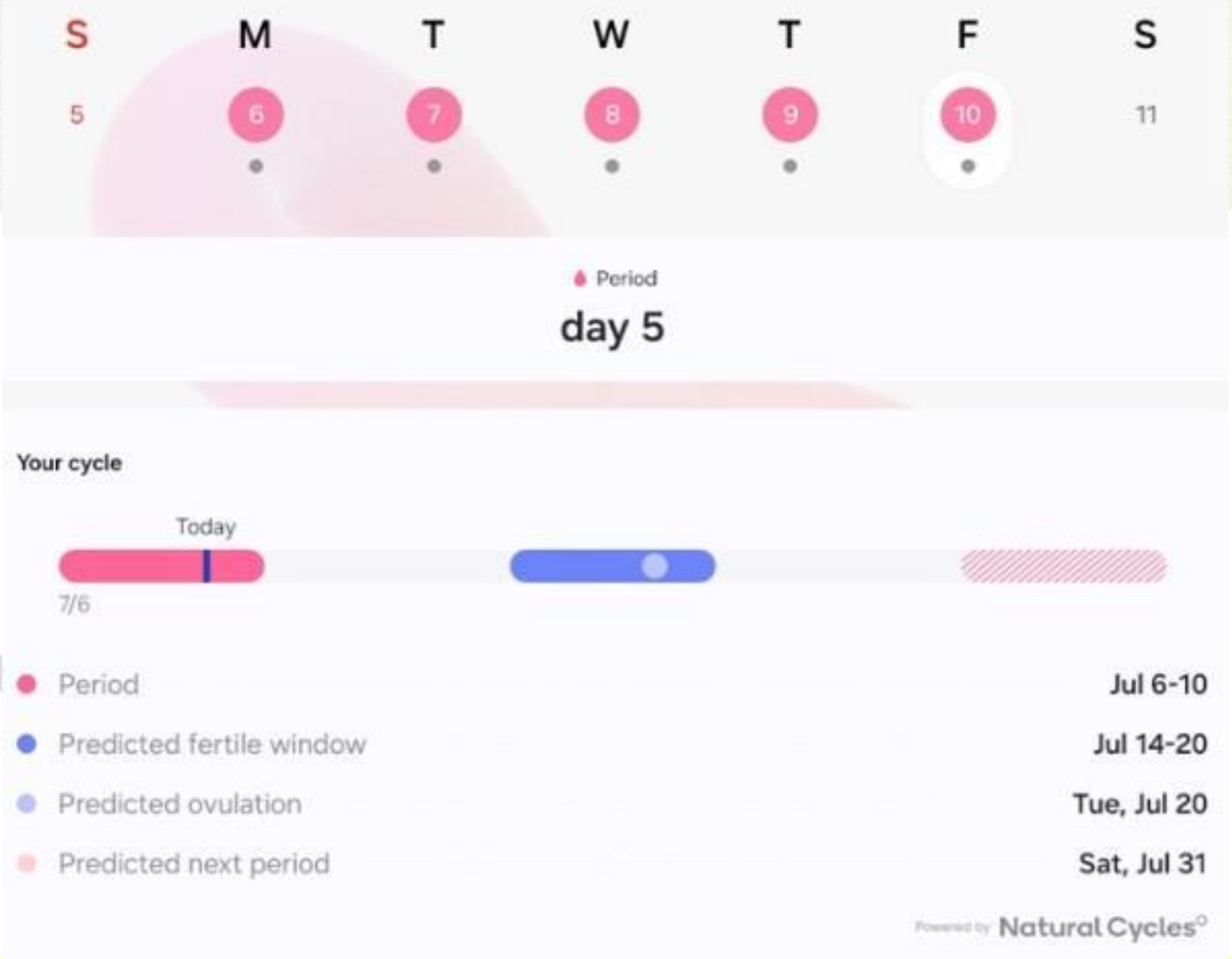
Health data sources and Data SDK



Samsung RING



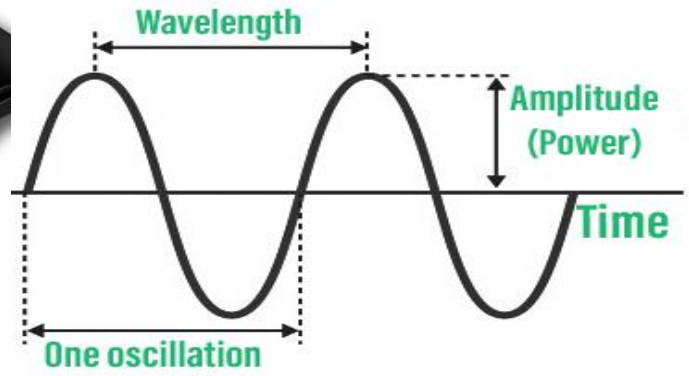




Samsung Health - https://miihealth.ai/

An app for heart failure alerts (Demo 1)

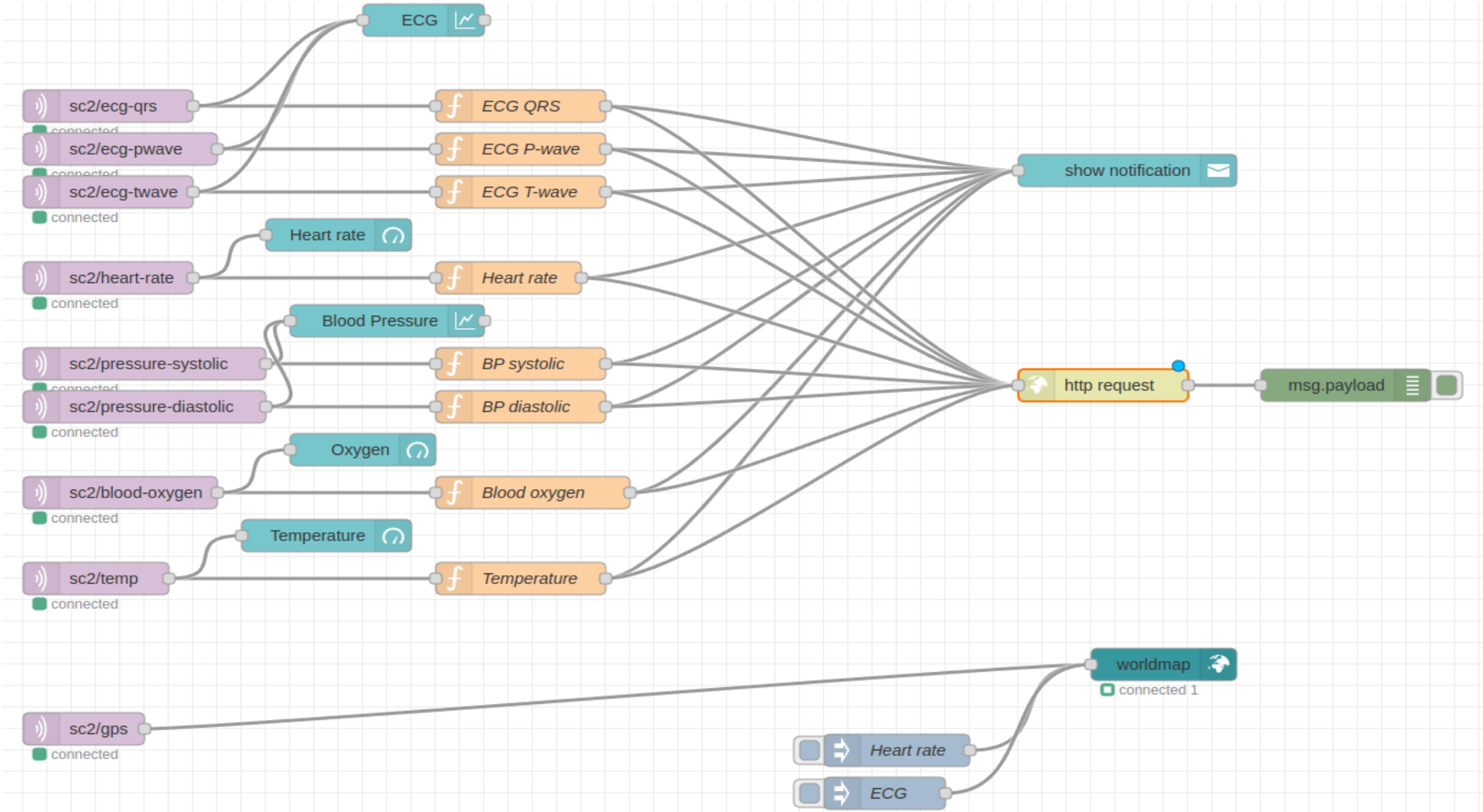
Heart Failure Prediction (https://iotsim.web.app/)



Parameter	Normal Range
ECG QRS width/amplitude	60-110msec/≤1mV
ECG P-wave width/amplitude	80-110ms/≤0.1mV
ECG T-wave width/amplitude	160-200ms/≤0.25mV

A doctor observes a graph that shows the electrical activity (in volts) of the heart of a patient over a period of time (in seconds). Each local maximum of 0.004 volts corresponds to one heartbeat.

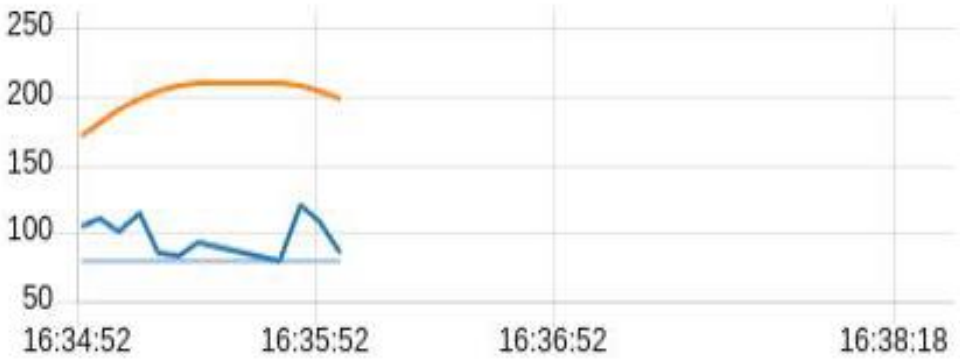
NodeRed's Blueprint for setting rules and alerts (server side)



Server side's Dashboard
for online monitoring the Patient's clinical status

Heart rate

ECG



Blood Pressure

Oxygen

Temperature

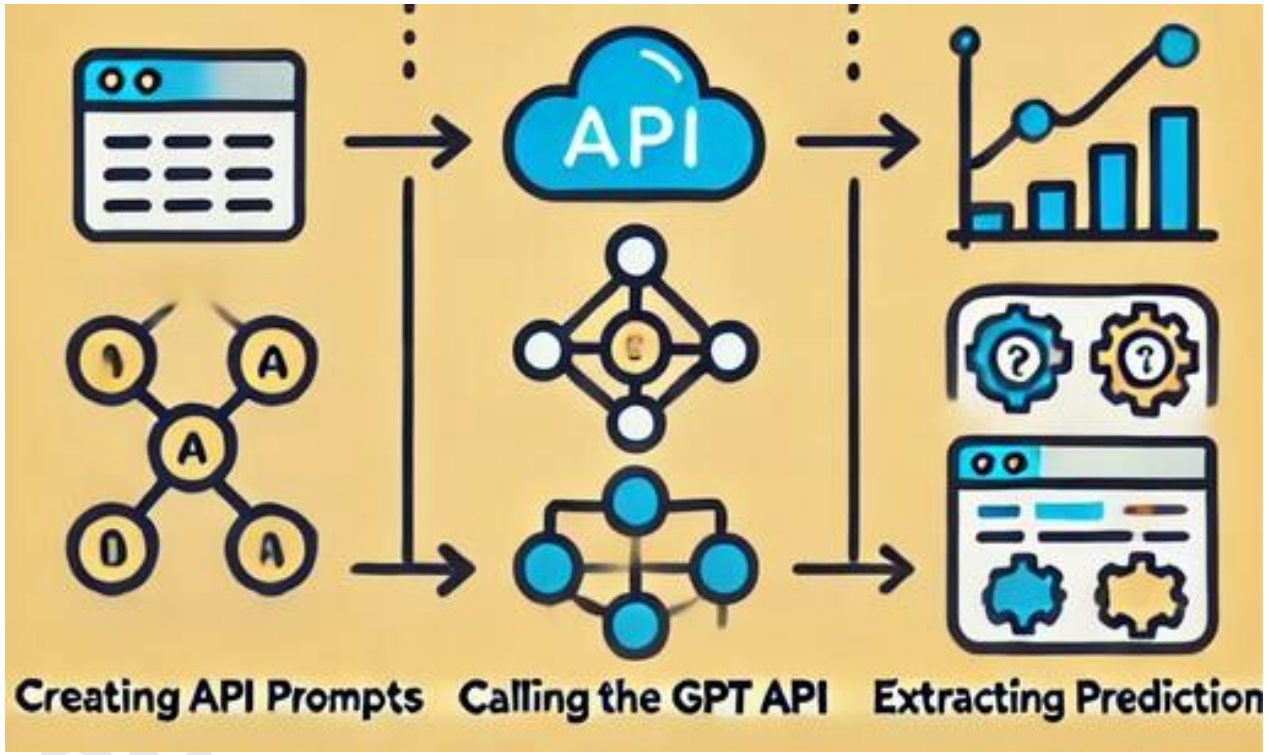
Predicting Heart Disease Using ChatGPT and OpenAI API

Utilizing Medical Data for Heart Disease Prediction

Features of the Dataset

1) `age`: Age in years
2) `sex`: Gender (1 = male; 0 = female)
3) `cp`: Chest pain type
4) `trestbps`: Resting blood pressure (mm Hg)
5) `chol`: Serum cholesterol (mg/dl)
6) `fbs`: Fasting blood sugar > 120 mg/dl (1 = true; 0 = false)
7) `restecg`: Resting electrocardiographic results
8) `thalach`: Maximum heart rate achieved
9) `exang`: Exercise-induced angina (1 = yes; 0 = no)
10) `oldpeak`: ST depression induced by exercise
11) `slope`: Slope of the peak exercise ST segment
12) `ca`: Number of major vessels colored by fluoroscopy
13) `thal`: Thalassemia (3 = normal; 6 = fixed defect; 7 = reversible defect)
14) `**num**`: Diagnosis of heart disease (**target variable**)

Methodology



1. Creating API Prompts: Formatting patient data for GPT API.
2. Calling the GPT API: Sending formatted prompts and receive predictions.
3. Extracting Predictions: Parsing responses for predictions.

Creating and Sending Prompts

```
def create_prompt(patient_data):
    prompt = f"Given the following patient data, predict if the patient has heart
disease (1) or not (0):\n\n"
    prompt += "age, sex, cp, trestbps, chol, fbs, restecg, thalach, exang, oldpeak,
slope, ca, thal\n"
    prompt += f"{patient_data}\n"
    return prompt

def send_patient_to_GPT(patient_data):
    prompt = create_prompt(patient_data)
    response = call_GPT_api(prompt)
    return response
```


This segment of the code creates a prompt with the patient's data and sends it to the GPT API to get a prediction.