SmartCityX: The AIoT Hackathon

Prototype Phase REPORT

Project name: 41. Pulse Sense
Team name: Sensor Squad

Team Lead:
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Theme: Urban Healthcare
Track: 1D Model

Idea Brief:
A portable AIoT digital stethoscope using ESP32-WROOM and MAX9814 microphone to capture heart and lung sounds.
A 1D machine learning model trained in Edge Impulse classifies sounds as normal, murmur, or abnormal in real time.
Results are sent via Wi-Fi to a MERN-stack dashboard for remote monitoring by healthcare professionals.
This low-cost, scalable solution supports early screening and continuous monitoring in urban healthcare

Software Requirements:
AI/ML Models: Edge Impulse – 1D Audio Classification Model for heart/lung sound analysis**.**
Website Tech Stack: MERN
Dataset: https: DATASET
Wokwi link: Wowki Simulation
Cloud Platform: Firebase(Realtime Database) , Google Sheets

Feasibility:
This project can be easily deployed in urban clinics, ambulances, and home healthcare.
The ESP32-WROOM with MAX9814 captures and processes heart sounds in real time.
A small 1D ML model runs on the device, so internet speed is not a major requirement.
Results are sent to Firebase and viewed on a web dashboard from anywhere.
The device is low-cost, portable, and battery-powered, making it easy to use.
Healthcare workers need minimal technical skills to operate it.
It can be scaled to many devices for city-wide patient monitoring.

S. No.	Name	Count	Purchase link/Offline store	Status	Price
1.	ESP32	1	Link	Bought	335
2.	MAX9814 Electret Condenser Mic	1	Link	Yet to order	216
3.	TP4056 Charging Module	1	Link	Yet to order	17
4.	Lithium Battery (3.7V 1000mAh)	2	Link	Bought	105
				Total required	223
				Total Available	440
				Total Budget	663