

Fifth Edition Of

WCE HACKATHON

***Innovate, Build, Deploy* 2022**

Round 1: Idea Submission

Team Name: HYDRA

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Problem identified:

A practical challenge faced in the field of assistive devices and orthotics is to measure real time efficiency of the device when fitted on the patient, such that the orthotist can better suggest the exercises/changes in gait to the patient. Analysis of data should be required to get analytics based on matrices.

Market Research:

Who are your customers and end-users?

Customers are Doctor, patient, therapist and end-users are patient

What are the solutions already available in market for your problem? How is your solution better than existing solutions?

Yes, solution already available in market for my problem. It is better than existing solutions for its flexibility, data transfer, use of wifi-arduino module

What impact will your project make on the current market?

It will impact huge in medical and IOT automation and innovation by helping doctor and therapist.

Project Name: ORTHO MONITOR USING IIOT GATEWAY

Describe your solution:

Solution for recording and storing metrics of normal and orthotic leg for analysis by Orthotist to provide corrective measures. An IoT enabled solution may be constructed to record the movements of the orthotic and normal leg based on various metrics like pressure, velocity and orientation. This data can then be stored or sent to the orthotist in real time and then displayed in the form of graphs for analysis. It would be an added advantage if the suggested solution is able to diagnose and suggest corrective measures based on the recorded data of the legs. The proposed wearable remote action tracker contains 10 DOF MEMS sensor modules (i.e., accelerometer, spinner, and magnetometer sensors) liable for detecting human development progressively. Here, the tracker offers four key functionalities, i.e., sensor information procurement (including sensor determination, inspecting rate, and obtaining span); information storehouse (transient information stockpiling for development acknowledgment purposes and long haul reinforcement information capacity); information handling (including information adjustment and FFT signal handling); and information correspondence (for the guideline of the information and the message correspondence design). The information obtained and revealed are arranged to suit the elements of the application. Nonetheless, for this exploration, and in view of our past examination, just a triaxial accelerometer sensor with a speed increase scope of ± 2 g has been utilized. The module likewise consolidates a continuous clock for catching a subject's development occasion period, a center RF for computational purposes, and a nRF load up holding the nrf24Lo1+ handset. Every one of the parts are portrayed in Figure 2 as a wearable tracker parts stack. This tracker could be connected anyplace at the upper or lower appendage of the human subject. In light of our prior examination, it was observed that the lower leg is the most reasonable area for the assortment of post-usable bone crack patient information. Accordingly, the movement tracker is joined to the human subject at the lower leg area.

The wearable action tracker remotely reports the subject's development speed to increase figured information to a neighborhood IoT door/edge gadget through a nRF module that uses its own upgraded ShockBurst correspondence convention. The passage (for instance Wifi arduino module, workstation, or brilliant cell phones) may deal with at least one wearable sensor engaged with at least one detecting type. These could be various remote wearable gadgets utilized by one client or may manage numerous clients.

For this exploration, a Wifi arduino joined with the nRF radio module was utilized as an edge gadget. The door offers four key functionalities, i.e., the correspondence convention (connected with the convention utilized and going about as a convention converter for information transmission and gathering); entryway calculation, (for example, FFT signal handling, starter acknowledgment information parts, and information collection); pre-cleaned or a last compacted development information storehouse for a short-and long haul development and handled information capacity. Be that as it may, the information can be overseen utilizing the mongo DB and MySQL data set, while door Cloud correspondence for Internet networks utilizes the Wi-Fi TCP-IP convention.

Technology Stack:

Frontend- C,Python

Backend- Django

Database- PHP,MySQL

Innovativeness:

The wearable activity tracker wirelessly reports the subject's movement acceleration computed data to a local IoT gateway/edge device through an nRF module that uses its own enhanced ShockBurst communication protocol. The gateway (for example wifi module, workstation, or smart mobile devices) may handle one or more wearable sensors involved with one or more sensing types. These could be multiple wireless wearable devices used by one user or may deal with multiple users. It will help in the growth of modern health technologies.

Show Stoppers:

Stoppers can be internet servers for large area.

Use Case Diagram/Flow Diagram:

