



# Motiv – A PhysioRecovery Solution

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## HARDWARE

- Consists of a comfortable multiple band system depending on the exercise chosen by the user.
- All electrical hardware is stored inside one minimalistic housing that easily attaches to the wearable band using velcro.



Electrical Housing Exploded diagram: Showing all electrical components inside the housing.

## ELECTRICAL COMPONENTS USED



**IMU 6050** - Accelerometer and gyroscope

Reasons for choosing -

- 6 Degrees of Freedom
- Small footprint
- Affordable and easily available



**TinyPico ESP-32** - Microcontroller

Reasons for choosing -

- Small Footprint
- Enough GPIO/ resources without comprising footprint
- ESP-NOW allows board to board wifi communication.

## WHAT IS THE PROBLEM?

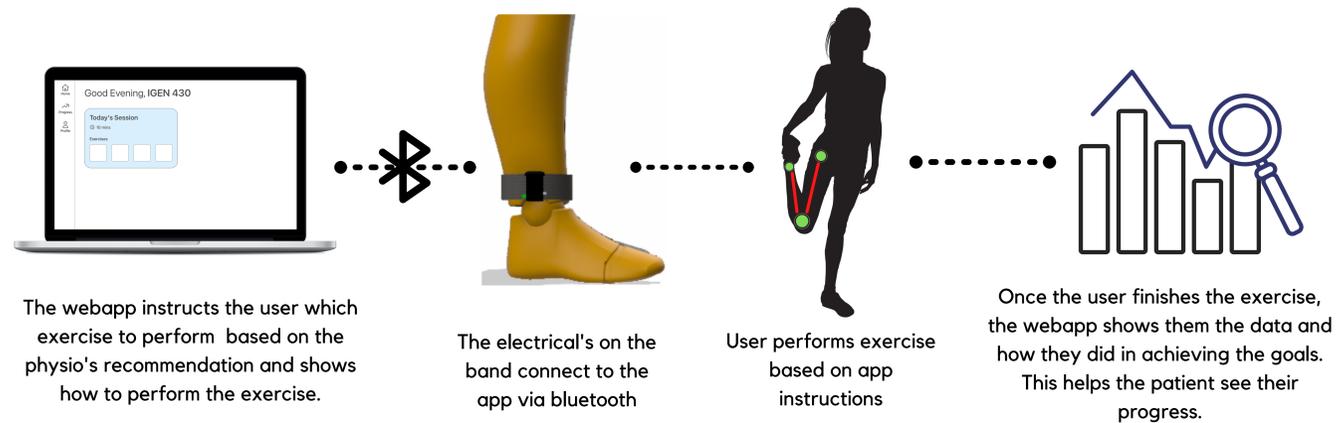
- 1) *Physiotherapy is expensive!* - Sessions can cost upwards of \$100/hr.
- 2) *People don't follow at-home programs* - Non-adherence can be as high as 50 - 65% in most patients.

## PROJECT GOAL

"To help patients perform physiotherapy exercises correctly at home, and to increase adherence to their exercise plans"

## OUR PROJECT

Our solution is a wearable device that works hand in hand with a web app instructing users on how to do desired exercises in proper form and full adherence.

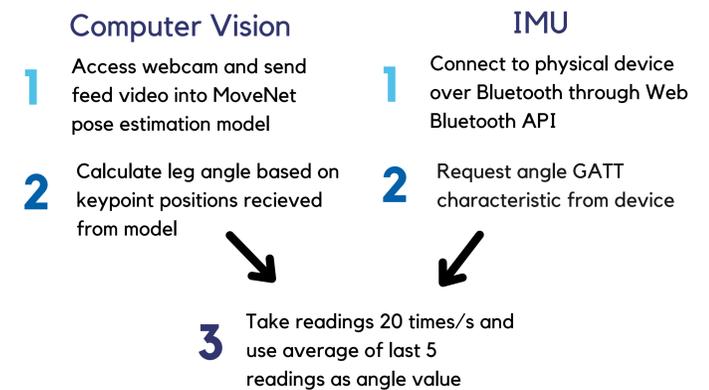


## FUTURE IMPROVEMENTS AND SCOPE

- IMU & CV combination**: Combine CV and IMUs to detect complex, 3D exercises
- Circuitry**: Ameliorate internal component layout of wearable
- Software**: Build native mobile app to have a more user-friendly environment
- Final Product**: Make casing and band production ready
- User Engagement**: Increase adherence by providing a more interactive environment
- Vision**: Increase exercises to incorporate different body parts

## SOFTWARE

Our WebApp has a computer vision model which works in tandem with the IMU hardware to perform the adherence for a user exercise



## SIGNAL PROCESSING

Using a moving average & complimentary filter for sensor fusion

