



RealSense Physiotherapy Guidance System (RPGS)

ESP3902
GROUP 3

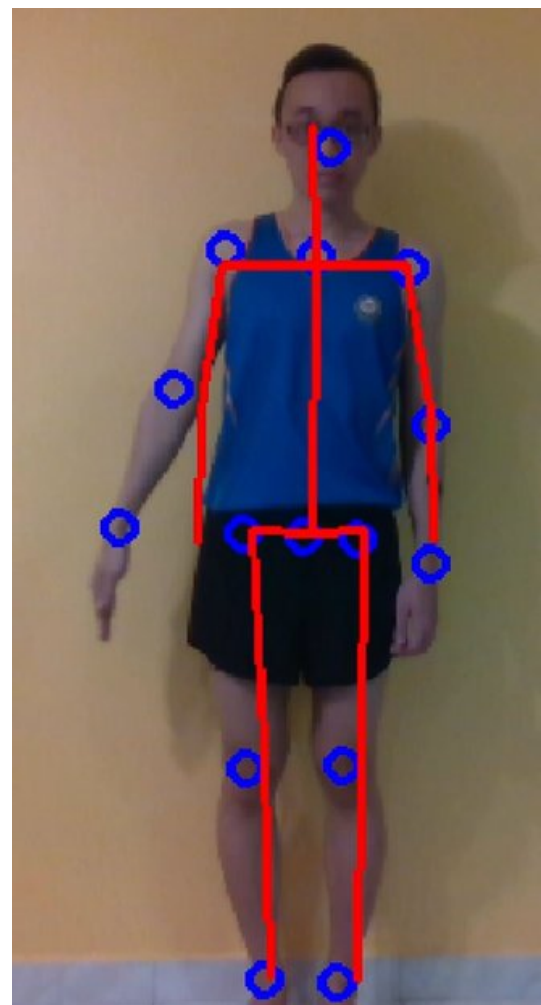
Product information

Ever wished your physiotherapist could be present even when you are doing your exercises from home? Wait no longer! Presenting, the RealSense Physiotherapy Guidance System (RPGS), bringing the physiotherapist into your home.

The RPGS is a system that enables gait analysis for unsupervised physiotherapy. It comprises of 3 components: an Intel RealSense D435 camera and a wearable module consisting of an accelerometer and an Arduino, and a user-friendly interface.

Unlike conventional 3D camera systems for gait analysis, the RPGS incorporates a wearable that allows for the detection of rotation of joints, a feature not common to the current market. With the synergy of the camera and wearable module, specific feedback regarding the user's posture can be provided in real-time. The RPGS also values inclusiveness, and different difficulty levels based on the patient's ability can be pre-configured by the physiotherapist in administrator mode.

With RPGS, one need not worry about performing exercises incorrectly anymore!



Product features & Specifications

- Horizontal field of view: 69.4 degrees
 - Vertical Field of view: 42.5 degrees
 - Diagonal field of view: 77 degrees
 - Operating screen aspect ratio: 16:9
 - Operating resolution: 640 x 360 pixels
 - Frames Per Second: 8.0
 - Suggested operating range: 2-3m
 - Ergonomically engineered wearable module to ensure comfort
 - Wearable module dimensions:
100mm x 60mm x 40mm
 - Wearable module weight: ~100g
 - 3D camera dimensions:
90mm x 25mm x 25mm
 - 3D camera weight: 72g
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- Standard deviations in joint detection at different distances from camera:

Distance (m)	X standard deviation (m)	Y standard deviation (m)	Z standard deviation (m)
1m	0.006	0.004	0.09
2m	0.006	0.004	0.09
3m	0.006	0.004	0.09



Intel RealSense D435 3D Camera



Wearable module containing accelerometer

User-friendly interface

The RPGS comes with an easy-to-use software interface

DUAL-MODE LOGIN

Two modes of operating the RPGS are available: Patient Mode and Physiotherapist Mode. The RPGS ensures the privacy of patients and effectiveness of exercises through these two modes.

PATIENT MODE

The patient mode allows the patient to select which exercise they want to perform from a list of pre-programmed exercises. Each exercise comes with a demonstration video of how this exercise is done accurately. The patient then enters an environment with a live feed from the 3D camera and real-time feedback regarding possible errors in posture.

PHYSIOTHERAPIST MODE

The physiotherapist mode allows the physiotherapist to customise the difficulty of exercises depending on the needs/abilities of the patient. Changes will be immediately implemented in the patient mode

