

# The Intelligent Diagnosis and Treatment of Postural Deformities by Analyzing the Given Data from Kinect Camera

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## 1-Introduction

Postural deformities are spreading among people. Any abnormalities caused by having a poor posture in the skeleton form is called postural deformity, such as: genu valgum, genu varum, asymmetric shoulders, and etc. Diagnosing and curing these deformities instantaneously not only optimizes the treatment, but also reduces the remedial expenses.

## 2- Methodology

To implement this project, we used Kinect camera, a gaming device provided by Microsoft Company. The project is accomplished in Unity game engine and with 3D concept for some medical purposes (Fig.1). Kinect camera is capable of tracking the body of the user standing in proper distance from it, the camera also comes with the measurement of the coordination of the user's body's joints. Having these coordination, we could do the diagnosis phase by comparing the received data of the user's body and the medical standards available for a proper posture, since the Kinect camera is not accurate enough for a medical diagnosis, we increased its accuracy by using averaging (the received data of 90 fps. will be averaged) and marker-based method (used for some joints that their coordination weren't measured meticulously by the camera). Having the coordination of the user's body we could also draw the skeleton of the body (also in 3D).

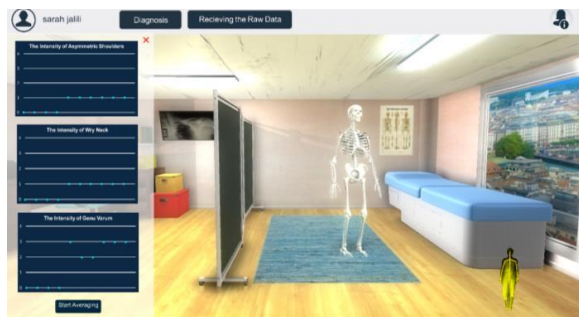


Figure 1- The implementation of the project in unity

There is a defined treatment mostly in the form of an exercise, for each deformity, according to the medical references. Having these treatments and using the motion capturing feature of the Kinect camera we

were able to guide the user through the whole process of treatment and monitor the process. Each user's information and their progress will be saved in a document for the doctor's supervision.

## 3- Conclusion and Results

To calculate the validity of the system, it was examined on 90 adolescences. The validity of each deformity is shown on the plot.

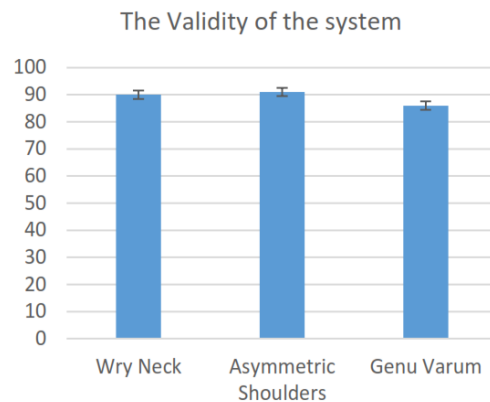


Figure 2- Diagram to show the validity of the system

The average accuracy of the system is about 89 percent. This system can be used as a replacement of the doctor in places with the large number of users such as schools which can prevent the waste of time and money.

## References

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