VIRTUAL FITNESS APPLICATION

NANDHAKUMAR S[1], PRAVEEN KUMAR V[2], VISHNU R[3], KALAISELVI A[4]

[1]*UG Scholar, Department of CSE, Kingston College, Vellore-59*
[2]*UG Scholar, Department of CSE, Kingston College, Vellore-59*
[3]*UG Scholar, Department of CSE, Kingston College, Vellore-59*
[4]Asst.*Professor, Department of CSE, Kingston College, Vellore-59*

--***--

Abstract - The objective of this application is to make a cross stage easy to understand application that offers clients the capacity to keep up with the wellness and find the wellness level for each day. The objective of wellness following applications is to gather information about the client's exercises. Everybody's first concerns have consistently included wellbeing and wellness. Some time ago, be that as it may, remaining fit and on-pattern was more troublesome because of the trouble of finding wellness mentors who you would appreciate working with. In this framework going to catch the client present and distinguish the client present like assuming the client is doing the activity accurately or not and guide the user. This application used CNN algorithm for pose detection and it contains a BMI calculator, weight tracker. Both virtual wellness and yoga arrangement are a similar screen. Prevalence of yoga and exercise is expanding day to day. The justification for this is the physical, mental and profound advantages that could be acquired by rehearsing yoga. Being fit actually and intellectually is each human being's definitive craving. Individuals are continuously trying to have a sound body wellness and they are some way or another participated in day to day life. Thus, we accept that our application can settle this issue in android gadget clients, the applications can be extraordinary alleviation to individuals who lack the opportunity to visit wellness focuses, through assist clients with canning deal with the sound life system.

Key Words: **BMI Calculator, CNN, Weight Tracker , Pose Detection, Action Correctness.**

1.INTRODUCTION

The other wellbeing related issues support a huge number of individuals all over the planet to do sports. That is the reason wellness application advancement is so famous today.

Another advanced pattern is obviously the utilization of portable applications - there are great many them for any conceivable part of your life you can hardly comprehend. Innovation improves numerous things and more straightforward. Sports are no exemption. Applications and cell phones have turned into a colossal piece of the present games culture, and wearables are having an incredible effect too, acquiring and greater prevalence every year.

As per Statista's conjecture, wellness applications that investigate wellness accomplishments like weight lifted or miles run are simply going to turn out to be more famous. We'll let you know how to make a wellness application. Our involvement with building such applications permits us to see every one of the patterns in this circle, and we might want to impart our mastery to you.
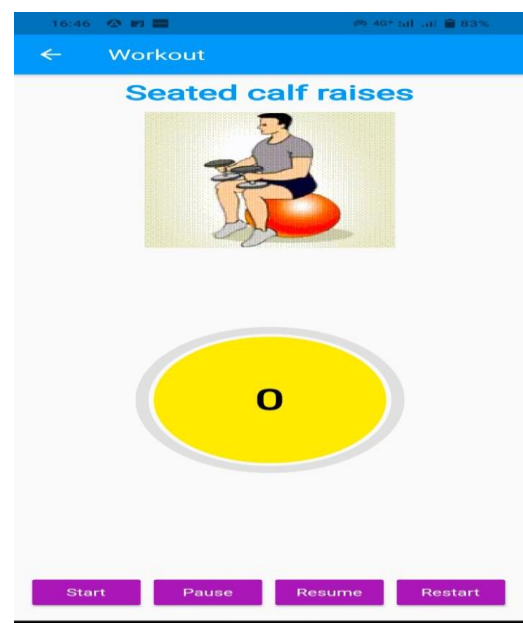

Figure 1: Virtual Workout

2. RELATED WORKS

[1]   The work done by author Kejun Zhang ,Qiliang Jiang, Xiaokun Zang " Virtual Personal Trainer via the Kinect Sensor " proceedings of ICCT2015.

Our regular routine is more advantageous than any other time before in view of the extraordinary

advancement of science and innovation. In any case, the lifting weights or wellness are continuously disregarded in present day to day existence. In this paper, we propose a Virtual Personal Trainer to give continuous outwardly activity guide and activity evaluation during the wellness season of clients through the Microsoft Kinect Sensor. The client activities are caught by Kinect and contrasted with standard activities to give a wellness score addressing how well clients perform activities progressively. Clients can see the skeletons of his/her own activity and standard activity in the screen along with recordings. An activity accuracy guide will be shown to direct the client to right his/her activities. Clients right his/her activities to match the standard activity in our pre-collected wellness activity library. Hence our framework can give interpretable input on how individuals can work on their activity. The entire framework gives a new definition of the family exercise center in the future with the force of human-machine intelligent in view of improving the life and shrewd, our group presents an answer for building a virtual mentor Kinect application. With this incredible asset, individuals can practice whenever and anyplace they need. Despite the fact that we have accomplish our essential objective that make the examinations between standard activities and genuine ones, the really compelling correlations are constantly restricted in the 2D ones because of a few specialized subtleties of the machine learning calculation utilized in the Kinect for Windows. We would find all the more profoundly later on and attempt a new method for introducing the answer for 3D activities. Besides, to accomplish a superior UI, we consider adding greater component like honor system and other modules later on.

[2]   The work done by another Yasheni Nair Indran Nair , Feninferina Azman , Fiza Abdul Rahim , Lim Kok Cheng " Reality Fitness   Mobile Application " proceedings of IEEE2019.

A disturbing reality that shockingly very few local people know about is that Malaysia has been marked as Asia's fattest country in the year 2015 up to this point. With overflow of food comes massive obligation to deal with our wellbeing, anyway that isn't true for Malaysians. In view of the review conveyed, very few incorporate practicing as a piece of their week after week standard as they focus on their work/concentrate over a 20-minute exercise meeting. The repercussions of this undesirable propensity are extreme, and may cause a worldwide pandemic of fat-stricken populaces later on. With that being said, 'Get through' is an application proposed to support alleviating the issue referenced. A wellness application consolidates a gaming climate empowering the client to be the first-individual player in a loathsomeness themed game. Utilizing vivid innovation like Augmented Reality (AR), clients can play this section by-part application while outside or inside. Get

through urges clients to challenge themselves by expanding the distance for each level while restricting the time expected to complete every last one of them. With the guide of an AR game item, clients will be pushed to keep their virtual-selves alive by expanding their speed with respect to the commencement clock. In short, the application is created to spur clients to keep their feet moving by establishing an essentially fun climate for the players.

A new report by The Lancet, a British clinical diary, demonstrated that Malaysia holds the main spot as the stoutest country in Asia. This disturbing truth was subsequently upheld by an overview directed by the National Health and Morbidity in 2015 that uncovered close to half of the neighborhood populace matured 18 or more (47.7%) were overweight as well as large. Regardless of the accessibility of different wellness applications intended to inspire clients and monitor their wellbeing status, apparently there is no foothold with regards to the highlights they give which could keep the clients locked in also, serious till it achieves tremendous changes as most twenty to thirty year old are effortlessly exhausted with applications that don't have a good time factor consolidated in them, thusly, the applications are uninstalled in a simple month as they neglect to discipline the client. As one of the top Asian food heavens, the nearby culinary variety assumes a significant part in Malaysia's movement and the travel industry area. Notwithstanding, this has achieved a few antagonistic impacts to our local area whom still can't seem to instill a sound way of life notwithstanding knowing the repercussions of hindering dietary patterns.
The actual center of corpulence in youthful puberty is the way they complete their way of life as well as the absence of activity engaged with their day-to-day daily practice.

An examination shows that from a test of 122 individuals, simply 39.3% were accounted for to have stepped up of attempting to shed pounds. Moreover, the vast majority of them favored faster techniques, for example, thinning items over a better system or an adjustment of their eating regimen. As food is bountiful, many are as yet uninformed about the negative ramifications of undesirable dietary propensities. By investigating our nearest family members, companions or even ourselves, very few can concur that they were acquainted with a relaxed exercise routine daily practice since youthful.

3.METHODOLOGY PROPOSED

Methodologies used:

A Convolutional Neural Network is a Machine Learning calculation which can take in an info picture, relegate significance (learnable loads and predispositions) to different perspectives/objects in the picture and have the option to separate one from the other. The pre-handling expected in a CNN is a lot of lower when contrasted with other characterization calculations. There are different structures of CNNs accessible which have been key in building calculations which power and will control AI all in all within a reasonable time-frame.

GUI Interface:

GUI provides an interaction between the user and machine.

Simple: The application will be straightforward and simple to explore, yet so straightforward as to make clients lose interest. While the application will be not difficult to utilize, it will likewise have a decent equilibrium for fledgling and experienced clients the same, to interest levels.

Engaging GUI: The design ought to be straightforward and utilize a simultaneous subject with a decent variety conspire, to get the notice of clients.

Reaction times/operability: Error messages ought to make sense of issues as they happen. The application won't leave clients on a stacking screen pondering when, if at any point something will occur, as this can prompt them not getting back to utilize the application. Toast messages make up the premise of this. The applications reaction time ought to be momentary so client doesn't lose interest. The GUI consists of four main stages.

1.Login or Signup

2.Virtual fitness & Yoga Alignment

3.30 days challenge

4.Logout

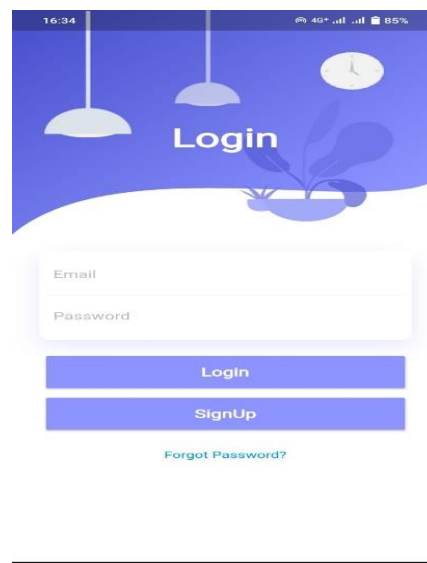**Step 1: Create a new account to access the application**

Figure 2: User Log-In page

Google Firebase: The application will likewise utilize google firebase to have client accreditations. The firebase verification usefulness is utilized for the login and signup strategies.
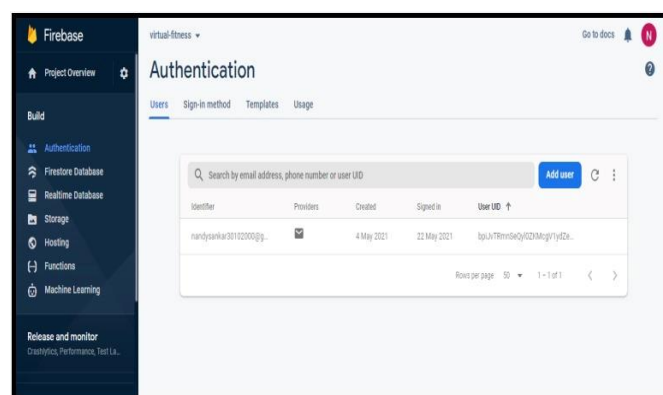

Figure 3: Google Firebase authentication

Step 2: Virtual Fitness and Yoga Alignment

Being and keeping up with our body fit is significant. Day to day practice assists individuals with conquering corrosion and keeps our body adaptable. Despite what individuals say regarding wellness, everyone likes to remain fit
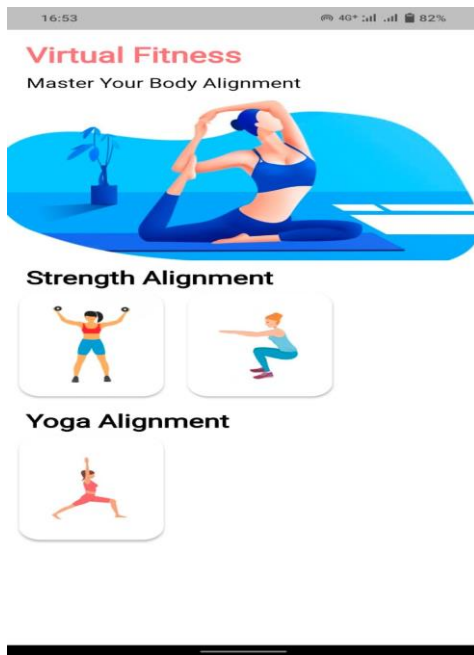
Figure 4: Yoga Alignment and Exercise

The objective of wellness following applications is to gather information about the client's exercises. This incorporates the quantity of advances taken, steps climbed, distance run, and other wellness measurements. To make it simple for clients to screen progress, wellness following applications give schedules and graphs and save courses. One more significant element is geolocation for following and saving courses on a guide
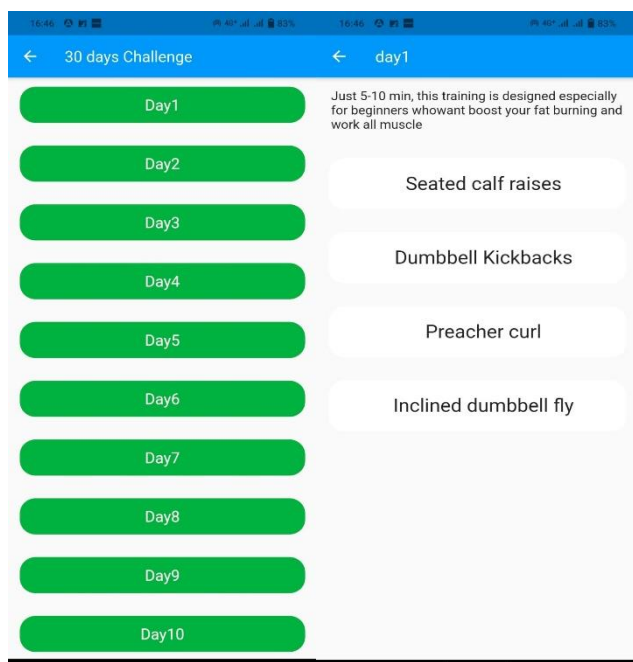
Step 3: 30 days Challenge

Figure 5: Day by Day Challenge

Practice for only 10 minutes consistently for 30 days in a row. Utilize this application to help you, or in a real sense simply plunk down, inhale profoundly, and see where your body takes you. 30 days is a very sizable amount of opportunity to find the extraordinary effect that pondering routinely can have on your physically.

Step 4: To terminate the application

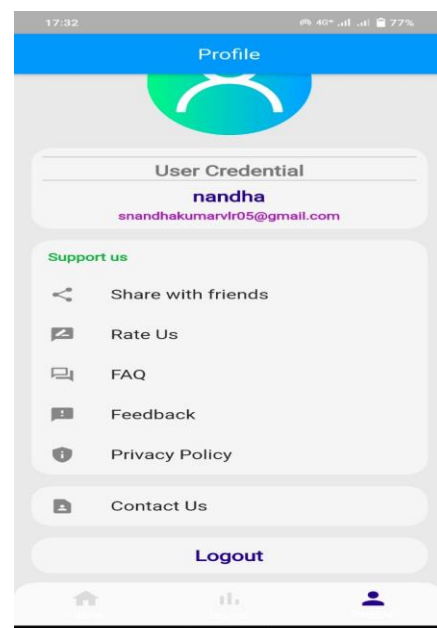If the user chooses to move out from the GUI interface, Logout.

Figure 6: Logout page

3. ARCHITECTURAL AND USE CASE DIAGRAM

The product engineering outline is a visual show of every one of the viewpoints that comprise a framework, either to some degree or entirety. It is a portrayal of a bunch of ideas that involve design, like its standards, parts, and materials. It is likewise a framework outline used to extract the overall design of the product framework as well as the collaborations, restrictions, and cutoff points between parts**.**
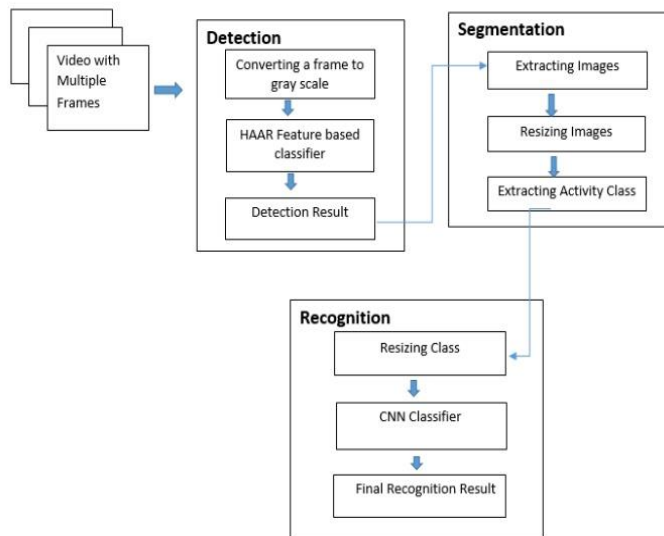
Figure 7: Architecture Diagram

Likewise, an engineering outline is an organization map used to portray the general construction of a product program as well as the connections, limitations, and cutoff points between components. It is a critical instrument since it offers a more extensive image of the PC basic actual establishment as well as its improvement plan.
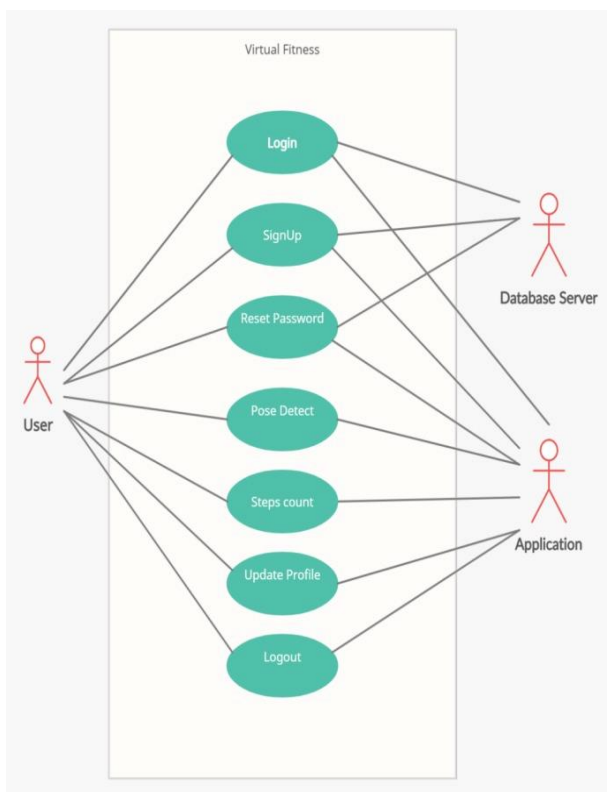
USE CASE DIAGRAM:

Figure 8: Use Case Diagram

A use case diagram is a graphical picture of a user's possible interactions with a system. A utilization case outline shows different use cases and various sorts of clients the framework has and will frequently be joined by different kinds of charts too. The use cases are represented by either circles or ellipses. The entertainers are frequently displayed as stick figures. While a utilization case itself could penetrate into a ton of insight concerning each chance, a utilization case outline can assist with giving a more elevated level perspective on the framework It has been said before that "Use case diagrams are the blueprints for your system".

5. RESULTS AND OBSERVATIONS

This application worked well efficient in every condition. We test our system in several actions such as BMI calculator, Yoga and Virtual Exercise. (Pose Detection).
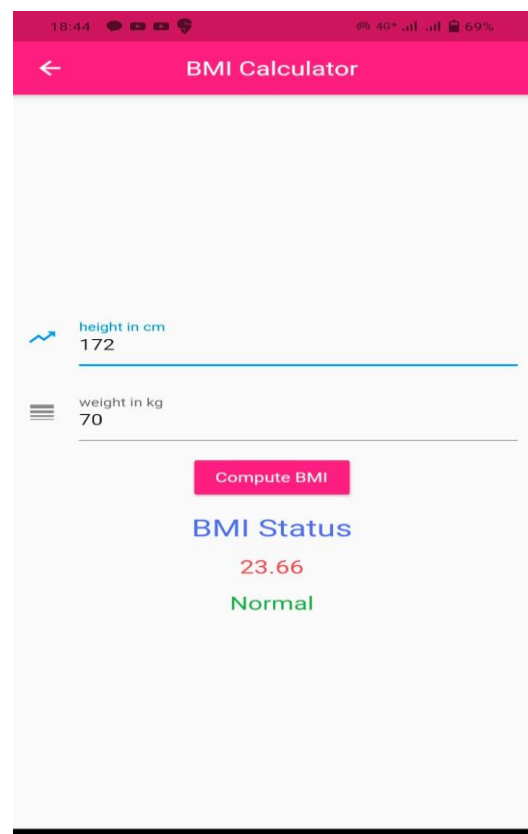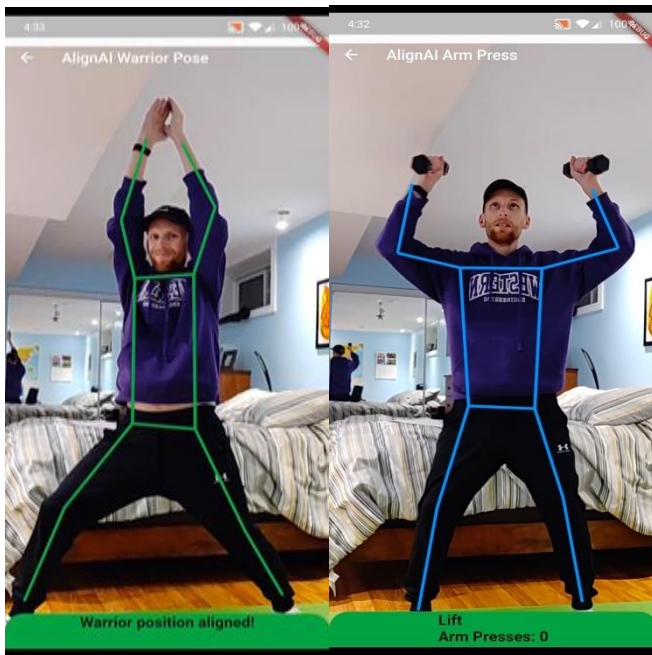

Figure 9: BMI Calculator

Figure 10:Pose Detection

ACKNOWLEDGEMENT

CONCLUSION

Our day today existence has become increasingly helpful with the advancement of innovation, individuals are losing more also, additional time and enthusiasm to get involved into physical work out. Hence, it's the inescapable pattern that numerous gadgets and applications will be created to make working out simpler and available anyplace. In light of improving the life and savvy, our group presents an answer for building a virtual fitness application. With this integral assets, individuals can practice whenever and anyplace they need. have accomplish our essential objective that make the correlations between standard activities and genuine ones, the genuinely compelling correlations are constantly restricted because of a few specialized subtleties of the machine learning calculation utilized in the application. We would find all the more profoundly later on and attempt a new method for introducing the answer for Dimensional activities. Moreover, to accomplish a superior UI, we consider adding greater component like honor instrument and other modules later on.

REFERENCES

[1] Massimo Camplani,Carlos Roberto Blanco, Luis Salgado, Fernando Jaureguizar, Narciso Garcia. Advanced background modeling with RGB-D sensors through classifiers combination and inter-frame foreground prediction [J]. Machine Vision and Applications. 2014.

[2] Da Wei Yu, Vu e Long Hou,Xiao Li Wang. Research on Landscape Environment with 3D-Reconstruction and Volume Measurement of Fruit Tree Canopy Based on Kinect [J]. Advanced Materials Research. 2013 (788).

[3] Vue H,Chen W,W u X, et al.Fast3D modeling in complex environments using a single Kinectsensor. Optics and Lasers in Engineering. 2014.

[4] Benjamin John Southwell,Gu Fang.Human object recognition using color and depth information from an RGB-D Kinect Sensor. International Journal of Advanced Robotic Systems. 2013.

[5] Shott on J,Fitzgibbon A,Cook M .Real-time human pose recognItIOn in parts from single depth images. Proc.Comp uter Vision and Pattern Recognition. 2011.

[6] Microsoft. The detection technology of the Visual Gesture Builder (V GB). https:llmsdn.microsoft.com/ en-usllibrary Idn785523.aspx.

[7] Yao, B.; Song-Chun Zhu, Learning deformable action templates from cluttered videos, IEEE 12th International Conference on Computer Vision. pp.I507-I5I4, Sept. 29 2009-0ct. 2 2009.

[8] T. Kodama, T. Koyama, and T. Saitoh, "Kinect sensor based sign language word recognition by mutli-stream HMM," 2017 56th Annual Conference of the Society of Instrument and Control Engineers of Japan (SICE), 2017.

[9] L. Beaulieu, "Balance Rehabilitation using Xbox Kinect among an Elderly Population: A Pilot Study," Journal of Novel Physiotherapies, vol. 05, no. 02, 2020.

[10] B. Y. Li, A. S. Mian, W. Liu, and A. Krishna, "Using Kinect for face recognition under varying poses, expressions, illumination and disguise," 2013 IEEE Workshop on Applications of Computer Vision (WACV), 2013.

[11] H. Cook, Q. V. Nguyen, S. Simoff, T. Trescak, and D. Preston, "A CloseRange Gesture Interaction with Kinect," 2015 Big Data Visual Analytics (BDVA), 2015.
[12] A. D. Calin, "Variation of pose and gesture recognition accuracy using two kinect versions," 2016

International Symposium on Innovations in Intelligent Systems and Applications (INISTA), 2016.

[13] S. Sorce, V. Gentile, and A. Gentile, "Real-Time Hand Pose Recognition Based on a Neural Network Using Microsoft Kinect," 2013 Eighth International Conference on Broadband and Wireless Computing, Communication and Applications, 2020.

[14] Y. Choubik and A. Mahmoudi, "Machine learning for real time poses classification using Kinect skeleton data," 13th International Conference Computer Graphics, Imaging and Visualization, 2016.

[15] Y. Han, S. Chung and S. Feng, "Automatic action segmentation and continuous recognition for basic indoor actions based on Kinect pose streams," IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2017.

[16] H.-T. Chen, Y.-Z. He, C.-L. Chou, S.-Y. Lee, B.-S. P. Lin, and J.-Y. Yu, "Computer-assisted self-training system for sports exercise using kinects," 2013 IEEE International Conference on Multimedia and Expo Workshops (ICMEW), 2019.

[17] K. Rector, C. L. Bennett, and J. A. Kientz, "Eyes-free yoga," Proceedings of the 15th International ACM SIGACCESS Conference on Computers and Accessibility - ASSETS 13, 2013.

[18] S. Hwang, J. Na, S. Park, and J. Baek, "Ada-Boostbased Gesture Recognition using Time Interval Window," Proceedings of the 2015 International Conference on Electrical, Automation and Mechanical Engineering, 2015.

[19] C. Brown "The modern yoga bible: the definitive guide to yoga today", Godsfield, pp. 32, 44, 46, 94, 103, 114, 2017.

.

[20] E. Trejo and P. Yuan "Recognition of Yoga poses through an interactive system with Kinect device" 2018 2nd International Conference on Robotics and Automation Sciences (ICRAS), 2018.