

AI DIGITAL FITNESS TRAINER AND MEAL GUIDE (TRAINENSOR)

BY: TEMITOPE ADEGOKE

STUDENT NUMBER: Q15693988

COURSE CODE: DISSERTATION(COM 726)

MODULE LEADER: MR FEMI ISIAQ

Catalog

Abstract	3
Chapter I: Introduction	5
Background	5
Aim and Objectives	7
Research Questions	8
Chapter II: Literature Review	9
Introduction	9
Artificial intelligence trainer session	11
Daily routine exercise	11
Improvement in performance	12
Motivation for health fitness	12
AI-powered personal coaching	14
AI-controlled wearables	15
Summary	15
Chapter III: Methodology	18
Proposed system for Application	18
Designing and creating a knowledge base	18
Training Model For Improving Physical Health Through Traditional Food	19
Training Model For Improving Physical Health Through Yoga	21
Design of Inference Engine	21
Personalized Dashboard For Predicting Their Health Level Using Big Data Analytic	22
Chapter IV: Results And Discussion	27
Data Set and Data Analysis	27
Experimentation	28
Descriptive Statistics	29
Frequency Tables	30
Regression Models	32
Discussion	36
Chapter V: Conclusion & Limitations	45
References	50

Abstract

Artificial intelligence power makes wearables smarter; in addition to collecting your health data, these wearables can now identify your irregular heartbeat and diabetes symptoms. Plus, it helps you track activity duration, calories burned, and that's just the tip of the iceberg. The major organizations that offer these wearables (Apple Watch or Fitbit) are currently trying to coordinate a virtual collaborator to give their customers clearer direction.

AI can similarly modernize fitness equipment and help customers use them effectively. Just enter some personal details and the hardware will advise them on completing and maintaining the form. By coordinating artificial intelligence in partner fitness apps, organizations can reach designated groups of people and make deals. Likewise, they can make better choices for the future based on the data collected by such apps. Additionally, AI-controlled chatbots can help app customers deliver a unique customer experience. Artificial consciousness can heal everything. As for fitness apps, it now appears that AI and fitness are definitely linked. It activates the application while greatly extending the promise. Additionally, expanded commitments will undoubtedly generate higher revenue.

While the application of AI in the fitness business is still in its infancy, its importance will soon become apparent. Additionally, promoting an AI-controlled fitness app with a clear focus can bring many benefits to customers. “Computer science, technology, and convergence science are all contributing to the growth of artificial intelligence (AI), which is a broad, cutting-edge research topic. Artificial-intelligence researchers must be well-versed in computer science, psychology, deep learning, and machine learning, to name just a few specialties. Therefore, to understand AI in physical training, one needs an understanding of both physical training and the technology that supports it (Yong et, al., 2018)”.

“The programme i developed is called ‘Trainensor’. It is an application designed to help people improve their body posture by detecting their workout attitude and counting the repetitions they complete. People who don't have access to a gym but still want to stay active may use this AI-based Workout Assistant and Fitness Guide to help them stay in shape at home. In order to ensure that they are doing the exercises correctly and avoid long-term and short-term injuries, personalized health and nutrition plans, as well as a daily workout calorie count, are all included”.

“There were two main goals: to offer a bottom-up strategy for real-time segmentation and estimation of the user's posture, and to build a single-shot approach that is effective”.

“The goal of AI is to create algorithms that allow computers to think like humans. Expert systems, pattern recognition, natural language comprehension, automatic computation results provision, and automatic programming are examples of these. Robotics, game theory, intelligent decision support systems, and artificial neural networks are also examples. Because of this, AI is focused on certain applications. As artificial intelligence (AI) advances, so do the training possibilities”

Chapter I: Introduction

Background

Technologies such as digital wearables enhanced with AI are well suited for the fitness industry. Some of these products and solutions have become more widely adopted, while others are just beginning to penetrate consumer awareness (Thompson 2018).

Finally, artificial intelligence will fully enter the fitness-related field. Advances in artificial intelligence make more responsive, customizable, and immersive digital fitness assistants available every year. For example, the “emotion” between people, this is the reason why coaching services cannot be replaced (Schmidt et al., 2015).

AI can make computationally precise decisions, but it cannot meet educators' trust needs in a human-like way. While advances in AI may fuel critical personalization techniques, achieving a spiritual and family-friendly experience is a short-lived challenge (Ramchoun et al., 2016).

This goal is supported by the human motivation hypothesis. Consistent assurance at the spiritual level is essential both for the development of the individual and for the overall purpose of the personality (Thompson 2018).

In 2017, a report by ReportLinker showed that the global digital fitness industry will grow by 33% to reach \$27.4 billion by 2022. The spike in smart fitness pace brought on by the new crown plague has made this number known before (Maleki et al., 2014).

Currently, artificial intelligence is being used to make home workouts safer, more personal, and as close to a fitness studio as one might expect.

Similarly, tech muscle rehabilitation brand Hyper-ice offers an app that connects muscle rehabilitation equipment such as the Hypervolt belt gun to wearables to reframe exercise routines, step counts, and rehabilitation programs based on the fitness market. AI has not only changed the fitness relapse and strength regimens, but also corrected different faults in the fitness (Maleki et al., 2014).

Apparently the ability to criticise stance was released in late spring 2020; new brand Yoganotch uses a wearable 3D motion finder to guide professionals to complete the correct posture; Mobile applications Onyx and Cure.fit use a 3D motion protection framework to analyse motion, the picture obtained by the mobile phone gives a comparative idea of repair. Artificial intelligence has great impact on fitness trainers, but that's not all. The main thing that the machine is not able to reproduce and achieve is complete disgust with sports injuries. Fitness training is rarely straightforward, and major and minor problems can arise during the training process. While the Sharp obstacle training device Tonal allows clients to manually reduce the weight of the training and thus save the settings, for individual common obstacles the client actually has to pass a “true self-assessment” of how to train safely (Maleki et al., 2014). Asensei is a knowledgeable clothing designer offering a variety of shirts and jeans suitable for tracking the development of the client's body, such as running, squat and comparison programs. Asensei savvy clothing uses motion capture and artificial intelligence technology to analyze the customer's action points and range of motion with sufficient action structure details, and can continuously develop good activity habits for customers.

Sensoria offers a similar AI-based wearable framework clearly planned for running and running. The Sensoria stage collects data from fancy clothing (Sensoria's own clothing or other IoT-enabled clothing). These data estimate the scope of development and biometrics. This includes

the heart rate, the speed at which the foot causes turmoil in the city and on the pedals, and the force of impact while running (Makridakis 2017).

Sensory checks not only offer suggestions for improving and improving exercise programs, but also scan and detect potential wounds during standby and distinguish points of failure in the activity chain. The planning focus of the Sensoria framework is to serve customers with healthy lifestyles and dynamic lifestyles (Moursund 2004).

Aim and Objectives

“Computer science, technology, and convergence science are all contributing to the growth of artificial intelligence (AI), which is a broad, cutting-edge research topic. Artificial-intelligence researchers must be well-versed in computer science, psychology, deep learning, and machine learning, to name just a few specialties. Therefore, to understand AI in physical training, one needs an understanding of both physical training and the technology that supports it (Yong et, al., 2018)”.

“There were two main goals: *to offer a bottom-up strategy for real-time segmentation and estimation of the user's posture, and to build a single-shot approach that was effective*”.

“The goal of AI is to create algorithms that allow computers to think like humans. Expert systems, pattern recognition, natural language comprehension, automatic computation results provision, and automatic programming are examples of these. Robotics, game theory, intelligent decision support systems, and artificial neural networks are also examples. Because of this, AI is focused on certain applications. As artificial intelligence (AI) advances, so do the training possibilities” (Farrokhi et, al., 2021).

Research Questions

The main research questions are:

- What is the use of the Trainensor?
- How can Trainensor help to improve the body posture of the people through detection of the attitude of workout and how can it help users eat healthy and right for their goal?

Chapter II: Literature Review

Introduction

The process of Artificial intelligence is the simulation process of human intelligence which can be performed on computer systems by machines. There are specific applications of AI which includes natural language processing, expert systems, recognition of speech and machine vision (Makridakis, 2017).

Artificial Intelligence (AI) has made itself indispensable within the fitness industry. The industry focuses on the physical improvement and maintenance of the human body. The health care and fitness industry has the potential for marketing sales and improving decision making between the companies in terms of leadership. The health club members concerning health and nutrition for the sake of individuals and their benefits, the members of the health club with a great mind set these days must be more exciting. Depends on the ability to reshape their habits with using the exercise equipment as their personal gadgets, with having useful data, also the data powered artificial intelligence within the industry. In the last few years, health and fitness has become an important part of Artificial intelligence (AI) in the industry. In healthcare and fitness the solutions of the Artificial language by reshaping the habits of the people of the industry (Makridakis, 2017).

In our daily lives, advanced tracking techniques become more prevalent with the Digital health and fitness technologies to get personal health data within the real time, such as heart rate, skin temperature and GPS. To evaluate the user performance with the exceeded limit of time, the health trainers and assistants can serve as wearable devices and fitness applications. Artificial

intelligence offers better opportunities to the users for the exercise patterns and health behaviors towards their fitness goals.

These types of devices have the goals for the users to improve further with their health and fitness. There are also companies like Headspace and fitbit which help users to maintain their health and take exercise planning along with meditation. Although, there are gaps in gaining good health habits due to such real world obstacles, such as budget, time management and location. Taking obstacles to the real world is essential to help users to affect their fitness truly with a design to maintain healthy habits. Artificial intelligence makes users healthier and fit to provide accurate smartphones and smart watches that are integrated.

There is technology to overcome fitness problems and their wellness where people are becoming dependent. The technology becomes very fast and introduces new fitness apps, mobile phones, laptops and different types of gadgets along with the wearables which have been launched recently in the market which creates all the buzz. The hype is increasing day by day of these new technologies of the digital world. People are addicted to the social world by using these new advanced technologies; especially children nowadays are addicted to mobile phones like crazy. Nothing bothered them more than these technologies which affect the fitness and health of the children and teenagers the most. A recent research report revealed that the fitness technology industry was \$17.9 billion and is expected to grow to \$62.1 billion by the year 2025 within the global worth. Artificial intelligence is getting deeper into the life of everyone.

In some cases, artificial intelligence performs better than humans. It is important as it provides insight to the operations that they are even aware of previously and particularly the detailed tasks with their legal documents analyzing the large numbers when it comes to repetition to ensure relevant fields which are filled accurately. Artificial intelligence is often done with their jobs on

time with relatively few errors. The efficiency in their new business opportunities helped them with a fuel explosion for larger enterprises. Artificial intelligence is prior to the current wave by using computers and also hard to imagine connecting with riders, but in today's world; Uber has become the most reliable and famous way to travel, and has also become one of the largest companies in the world by giving services to the people. When people want to travel in certain areas through uber, it helps get the drivers on the road to make their ways.

Artificial intelligence trainer session

In artificial intelligence the trainer gets some time to go to the gym and make you exercise with an arm and leg in the chaotic existence. Personal training sessions are important for everybody but they may not be cheap. Integrated fitness applications are a more significant approach for the people who don't want to compromise on their health and fitness. They put in every possible effort to achieve their goal.

Artificial trainers perform like human trainers as they advise the proper medium more excitingly. The professional fitness trainers trained you to the maximum extent and also gives you feedback throughout exercise on your posture. The artificial trainers application is a human driven pose estimation with the artificial that is an interesting breakthrough technology.

Daily routine exercise

The major benefits of the fitness applications is utilising the workout anywhere anytime. To get more motivated during workout or doing machines, you can listen to the music on your mobile phones by using hands free or Bluetooth devices. The rhythm of the music brings more energy in the body and this can speed up your body to perform better. In the fitness world, there are no

excuses to leave your workouts even if you are on a business tour, and whether on a family vacation or maybe any reason regarding your daily routine. The value of contexts in the virtual agents to perceive with greater levels as compared to trainers. The virtual trainers promote physical fitness with the promising benefits. The effectiveness of the virtual trainer depends upon the effective tone to use when it comes to motivating users.

Improvement in performance

The artificial technologies may provide meaningful insights, height, weight and different types of characteristics to help them create such fitness objectives for the individuals based on a broader range of criteria. There are various fitness devices and wardrobes for the fitness enthusiasts that help them focus on their health fitness by improving their performances through exercising. Artificial intelligence can be maximized by using way outs for artificial intelligence fitness in the future. The users can also increase their performances to gain fitness objectives.

Motivation for health fitness

Everyone need to look great. Still, finding the motivation to exercise can be difficult at times. Plus, our unstoppable fast-moving crazy lifestyles make things even more confusing, making it difficult to get enough time out of our busy schedule to get to the fitness centre. Then again, at this point, there's the issue of maintaining healthy eating habits, which is pretty important and is probably more of a test than actual activity. "With so many questions answering such a wide range of options, it can often seem a little intimidating, especially if you're new to the world of fitness. Anyway, don't be afraid, it will get less complicated. Physical inactivity is thought to be one of the leading causes of death from gambling in general and can contribute to a variety of

health problems, including cardiovascular disease, diabetes, cancer and mental health conditions. According to the new Lancet Global Health Report, around 27.5%, or more than a quarter, of adults worldwide did not get enough physical activity in 2016. Overall, women are 8% less active than men, and physical inactivity is almost twice as common in major league income countries as in low income countries”.

Aaptiv, the startup behind a well-known voice-based fitness app, recently announced another aid called Aaptiv Coach, an AI-based partnership that provides each client with a personalised fitness and lifestyle plan. Goals, current fitness levels, dietary habits, and data from wearable devices such as smartwatches and fitness trackers.

After three years of refinement, the product's calculations are trained on data gathered from more than 22 million studies the organization has submitted worldwide to date. This helps individuals understand how, when and where they like to exercise and what they need from the classroom. Ethan Agarwal, pioneer and CEO of Aaptiv, said, “Whatever the idea, what can we do to help individuals achieve their goals? said. Assuming you're tackling 45 minutes 3 times a week, that's basically 2% of your week. However, there are many organizations looking for that 2%: entertainment centers, startups for family walks, and from there, the sky is the limit. However, as we know, the rest of your time is 98% is the framework you're used to where you really want to start building the build”.

Given the data customers share with the app, coaches will tell them exactly how to reach their goals. Clients first fill out a full questionnaire, which is then combined with their training histories to create a temporary daily, weekly, and monthly personalized design that fits their schedule, and no two clients receive a similar schedule. Customers can likewise choose between

following one of Aaptiv's workouts run by another person or doing it all alone while estimating their progress in AI.

AI-powered personal coaching

Long a necessary part of the fitness business, personal training is often a very complex, person-to-person experience. However, new AI-centric companies are starting to corner the market and provide fast and affordable personal training.

Organisations like 'Shft' already offer AI-powered digital coaching apps to focus on how individuals exercise and provide workouts and motivation tailored to fitness goals. These mobile medical apps allow for flexibility – clients can adapt to fitness with assistance rather than working on a human trainer's schedule.

Planet Fitness has developed an AI-powered app that connects with the fitness equipment of entertainment centres to deliver more personalised fitness guidelines to its customers through a variety of channels. The app helps clients understand how to properly use different machines and equipment, and provides specific strength and retraining. Customization allows customers to practice at their own pace without the hassle or humiliation to evaluate new gear while maintaining legal structure, safety and technology.

Additionally, Under Armour has partnered with IBM's Watson to create the UA Record App, which provides guidance and guidance on an individual's activity levels and daily routine, including fitness, nutrition and rest. Controlled by psychological developments, the app can modify individual clients' fitness programs, track food consumption through PC vision innovations, and recommend exercises based on neighbourhood climate, perceptibility, and objective orientation.

AI-controlled wearables

Artificial intelligence technology is making wearables smarter by studying activity levels and how the body responds to strenuous exercise. Tech brands and clothing organisations are creating relevant and sophisticated wearables to help customers get a more complete picture of their health. Fitbit, for example, has combined artificial intelligence and personalised coaching to assist customers on their fitness journey and consider quiet observing away from healthcare providers.

Combined with advances in AI, AI-powered wearables can detect changes in key metrics that, given advance diagnosis and treatment, could indicate a customer's health problems like diabetes or high blood pressure. AI-controlled technology can likewise help prevent scars by suggesting adaptations to a client's running rhythm or adapting to shape during a weight-lifting workout (Dharmaraj and Vinayanand, 2018).

Summary

It has been seen that people hardly get time to practice exercise on a regular basis because of the less time and a busy routine. Although, artificial intelligence always tries to overcome the issues in fitness. The new advanced technologies and applications can make the people more aware of the fitness journey throughout.

Artificial intelligence is already known in almost every industry and more people are familiar with it. Therefore, the technology enables people to exercise well to stay healthy and fit and also achieve their fitness goals without taking any help from anyone. They can easily workout at their

homes, managing any time for themselves. Also they can take help from social media such as YouTube by watching fitness exercise yoga programs.

Artificial intelligence has several mobile applications with artificial intelligence assistants to individuals by offering them fitness and diet plans. There are some applications through which they can assist their users to track their everyday fitness by taking steps and working out (Mick, 2006).

Artificial Intelligence has already set its foot in almost all types of industries including fitness and health. Fitness apps integrated with AI help the user to achieve their fitness goals without going to the gym. Today various fitness applications are integrated with AI personal assistants, in the market that offers exercises according to fitness goals and eating habits of users. Also there are some applications that can help to track their daily fitness routine. Apart from these exercises, artificial intelligence makes better decisions which generates sales business. In this manner, people usually get enough time to workout at home or gym with the management of time. It's not easy to hire a personal fitness trainer because they are too costly (Agarwal et al., 2022). Artificial intelligence is available for the users of smartphones anywhere. They use premium plans for long hours for their workout sessions by watching videos of trainers.,

In artificial intelligence, fitness applications offer you personalized training and fitness plans measuring their fitness goals, eating habits, fitness levels and much more.

The benefits of artificial intelligence in the fitness industry are potentially strong. Artificial intelligence can help avoid human error which is as important for human services than in any other industry.

Fitness applications can offer real time commands through synthetic intelligence. There are some organizations which are working for the development of sensors that can be installed to reveal your fitness through movements.

By determining body movements, the sensors will be customized to flow through your body. The sensors result in the best workout with yoga, but further they are planning to revolutionize other industries as well. This is the way through which artificial fitness can help you out. Also they are planning to integrate those sensors with the branded garments by partnering up with the brands (Mathew and George, 2022).

Chapter III: Methodology

Proposed system for Application

This is an application named *Trainensor* for people who usually suffer mentally and physically, in order to strengthen their capabilities and improve their well-being. The program as a whole is intended to provide advice on the types of foods that could be consumed to increase immunity depending on their medical status and to provide simple activities to enhance their general physical health by resolving concerns with mental health. The whole idea behind making this application clearly tells the relation about the proper diet that is going to help a person in improving their immunity including all types of people irrespective of their age and health condition. In the second picture, the whole system of the application is mentioned, including some sort of exercises that are quick to learn and not too heavy on muscles for the sake of enhancing the mental and physical strength of people.

In this application, there are four main categories that are as follows:

1. Designing and creating a knowledge base.
2. A training program for enhancing physical health through wholesome, eating, yoga, and physical activity.
3. An inference engine's design.
4. Big data analytic-based personalized dashboard for predicting health status

Designing and creating a knowledge base

Designing and creating a knowledge base has a crucial part in manufacturing this personalized health application, for this, I collected data from individuals going to the gym and from random people to make a more substantial and meaningful dataset. The information that relates with homeostasis, and basic home based diet is prescribed through nutritionists and dietary experts whereas fitness and yoga experts tell about basic exercises which can easily be done at home.

The expertise plot, the treatment plans, the techniques through which disease can be diagnosed, also there are instructions that need to be obeyed in certain symptoms for encouraging the usage in order to get the best result (Moursund 2004). For that there are some features that are mandatory in creating a knowledge base development.

- Films on how to workout at home
- Films on weight reduction exercises
- Films on easy aerobic workouts
- Films on how to prepare simple immune-supporting foods Videos of relaxation techniques and asanas connected to breathing (Vaishya et al., 2020).

Training Model For Improving Physical Health Through Traditional Food

Not everyone has a diet that is adequate and nutritious. It relies on a number of variables, including age, gender, way of life, level of physical activity, ethnic cuisines, and dietary traditions. People began ingesting more high-energy, fat- and sugar-based foods as a result of being confined to their homes (Novatchkov & Baca 2013). They frequently neglect to consume enough produce, fiber-rich foods, and fruits. This results in an unbalanced diet, which opens the door for numerous health problems. Impaired immunity, greater susceptibility to many diseases, deteriorated physical and mental health , and decreased productivity are all consequences of poor nutrition. A healthy diet refers to one that includes a range of foods in sufficient amounts and proportions to provide optimal levels of nutrients for staying healthy (Mick 2006).

Various food types make up a well-balanced diet; the focus has switched from flavor to a nutrition strategy that is nutrient-oriented. Everyone needs appropriate nutrients. Yet, the needs of a baby, a child in development, a grownup, a woman who is pregnant, and an elderly person varies. Meals can be grouped into the following categories based on their function:

Meals can be grouped into the following categories based on their function: Whole grains, cereals, millets, vegetable oils, ghee, nuts, and other foods are included in the food list. items.

- Protein-rich foods that are beneficial for growing muscle. Pulses, nuts, milk and milk products, meat, fish, and chicken are examples of food items.
- Great resources of vitamins and minerals are beneficial foods. Green and leafy vegetables, fruits, eggs, milk, and milk products are examples of food items.

Training Model For Improving Physical Health Through Fitness Trainer

People's health and physical exercise are directly related to one another. A healthy individual is constantly engaged in their task. Having a healthy, balanced exercise routine also prevents numerous ailments. The American Heart Association advises adults to engage in with at least 75 minutes of vigorous activity or at least 75 minutes of strenuous activity a week though. Even when the gymnasium is down and there is a lockdown, there are several methods to be active while maintaining social distance. A list of straightforward exercises has been created and designed with the help of experts like fitness trainers depending on their interests and individual matters.

Exercises aren't a problem for the ones who want to do it at home as it easily can be done at home even if one has a small area and lacks the instruments related to exercise. Out of many there are some simple exercises mentioning here for example:

- Walking in vacant space
- continuously sitting and then getting up from a chair
- playing with children
- prefer standing up even if you have the option to sit
- quickly going upstairs and then coming downstairs

Training Model For Improving Physical Health Through Yoga

Yoga is a crucial tool for enhancing immunity and respiratory conditions in people of all ages.

Yoga can be practised on a basic mat or on a chair for 20 minutes, including pranayama. These asanas can be practised by people of all ages to enhance both physical and emotional well-being.

Yoga asana practice, particularly breathing techniques, aids in respiratory system improvement.

The numerous things to think about include:

- Yoga and asana can help relieve stress
- stimulate the immune system
- maintain a healthy body weight
- relieve stress and anxiety
- avoid gaining weight.

Design of Inference Engine

Through using simple reasoning to the knowledge base, the inference engine's job is to derive new knowledge. By utilizing the patient's actual information, the inference algorithm detects the hazard from a big amount of information from various demographics. Various expert contributions, including those from doctors and dietitians, are included in this study. To help clinical practise, powerful artificial intelligence technologies are used to obtain relevant findings. Machine learning tools are used to identify data trends and develop pertinent conclusions that might be used to treat patients more healthfully. The common guidelines to follow to determine if a person has fat or not are listed below.

“Rule 1: If BMI <18.5”

“Rule 2: If BMI >= 18.5 and BMI < 25 then classifies the subject as normal”

“Rule 3: If BMI > 25.0 and BMI < 30 then labels the individual as obese.”

“Rule 4: If BMI > 30.0 then labels the individual as morbidly obese.”

Obese patients run the risk of developing type 2 diabetes. Their elevated levels of blood sugar can be controlled with the aid of an appropriate diabetic dietary pattern. 1,500 to 1,800 calories each day can be recommended as a diet to encourage losing weight and maintaining healthy body weight.

Rule 5: If obese > select a 1200 calorie diet plan.

Personalized Dashboard For Predicting Their Health Level Using Big Data Analytic

Individuals use customized healthcare dashboards in this electronic era. The delivery of the appropriate diagnosis and course of action for each unique patient is referred to as customization. An individual's life will be made easier by the easy integration of vital patient-related and other operational data into a healthcare dashboard. On the basis of the conclusions reached by the engine, customized medication is recommended. Every person's data is frequently stored in terms of various facts. These would assist us in making judgments and making recommendations to the public in a consistent manner. Actual statistics are examined, and precise treatments are recommended based on the set standards, all of which contribute to better patient's experiences.

A revised schedule of fitness app improvements enables fitness centers and fitness organizations to use benefits including artificial intelligence to add value to redesigned diet and nutrition practices. Whether setting dinner or providing calorie-counting instructions, diet-editing apps require an AI-driven focus. These key points track the client's progress in changing their eating habits with the help of a self-modified diet plan calculation. These calculations apply to data collected at a given time.

The user can log all of the meals taken throughout the day and send them to their trainer for analysis. Using this method, the user's personal trainer can give the user specific comments on whether or not his or her diet is healthy. This functionality has been created so that it is very easy and fast for the user to add what he or she has eaten, as adding meals by finding them from a vast list or by manually writing a description of them can be highly annoying.

Figure below shows how the user can photograph the current meal and add it to the app.

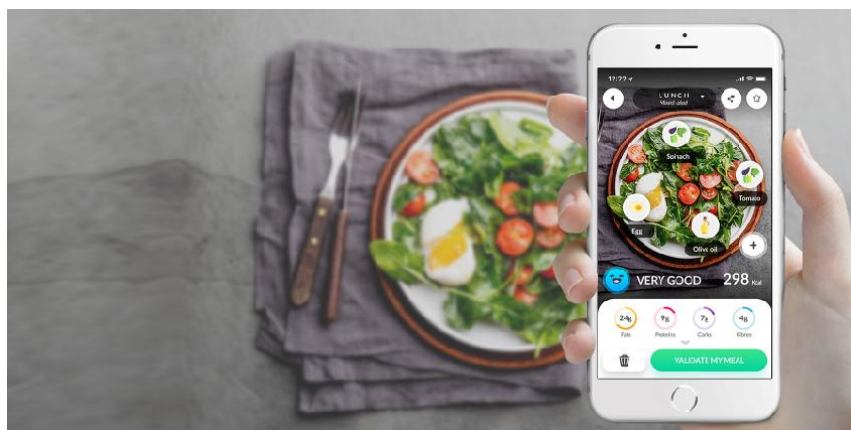


Fig 1 showing user logging meal

AI-driven eating ideas are more personal and actionable for customers. App customers can seriously consider their dietary regimen to maintain good health through an AI-based diet and support app.

This use is similar to facial recognition technology. Even so, the entire human body here actually collapsed while looking at the posture while covering its face. Human Posture Assessment can break down body position in 3 ways -

Figure Modeling - Covers the width of the body, including the middle and extension.

Volume Modeling - Volume imaging using 3D body filtering technology allows AI-controlled applications to process the body in different mathematical ways.

Skeleton Modeling - undertakes the design of the skeleton. It is important to check the position of the tendons and bones during exercise.

Overall, the concept of human posture assessment helps app customers perform activities and exercises with correct posture when developing custom fitness apps.

Artificial intelligence technology is designed to explore available data. A dynamic application of AI in fitness is its coordination with wearable.



Fig 2 shows AI application example with wearables

All wearables, whether Apple Watch or Fitbit, can collect customer data, but with the participation of AI, sporadic heartbeats can be identified in advance, reducing the risk of stroke or heart failure.

Artificial intelligence is making wearables brighter and can track workouts, workouts, and surprisingly core boundaries. Next, AI-powered wearables will provide clearer, more personalized consideration and build a customer's overall health profile.

Mobile app development organizations can support the management of leisure centers or fitness organizations by creating fitness tracking apps and personal trainer apps. AI-based personal trainer apps can be a unique advantage in the fitness industry.

These applications enable customers to achieve their fitness goals with the help of artificial intelligence. Personal training apps in artificial intelligence are designed to provide customers with a personalized experience while offering a fitness program tailored to their goals.

Likewise, these apps can also be used as AI-based personal trainers. They can control workouts and the right clients like a real fitness trainer. All they need is a phone camera. Clients can effortlessly obtain ongoing information about their activities, body posture and training.

AI helps automate and customize many cycles, which can also reduce costs. For example, artificial intelligence is very useful in customer assistance. You know how digital channels can be a great way to reach shoppers. By running a virtual client collaborator (VCA), you can handle client requests in mobile applications, sites, and informal organizations without too much stress. It can be seen that the use of VCA has reduced phone and email requests by 70%. Artificial intelligence enables you to provide customers with a smooth engagement that increases satisfaction.

Once again, AI in fitness clubs can help close more leads and generate more revenue. Based on current and past discussions, there are some insightful deal widgets to help rate each ride. However, he was equally able to correct correspondences to possible cues with little human hindrance. They then send alerts to sellers when the ideal time to negotiate is the right time. Along these lines, it ensures that you don't miss out on potential opportunities to convert leads

into customers. Plus, by aligning your top-up plan with the fitness center management framework, you can close deals faster. By integrating AI into fitness, you can convey the same focus on your product to your existing customers. For example, let's say they need a personal training session or a diet chart. In this way, you can increase your income. AI can coordinate between different fitness devices and wearables, helping fitness geeks and newbies come up with personalized fitness goals based on different constraints. Levels, weights, and different perspectives are all considered data, and artificial intelligence techniques can generate vast amounts of information. For now, clients can exhibit while achieving their fitness goals. The use of AI-driven applications will then open doors to the benefits and value of AI in fitness. When AI-based highlights are incorporated into a redesigned fitness app, organizations or clubs can attract more people to their management and process their deals. Likewise, they can gradually follow conscious choices by gaining important lessons from AI-based events.

Likewise, fitness app development organizations can incorporate AI-based chat-bots to provide app customers with a unique, human-like customer experience. You can work both externally and internally to all the executives who drive the deal and the executives in general.

Chapter IV: Results And Discussion

Data Set and Data Analysis

In this study, I used a data set in csv file attached to this project. The data set utilized for analysis which is a CSV file that provides information on the user, their gender, age, and some other basic questions which defines their behavior towards exercise, their diet and the time they serve in exercising. The collection of this data-set was done by me, along with the help of some of my friends while we visited the gym. I also created a survey form to get more inputs.

The majority of the information was contributed by my close friends, gym friends, online friends and members of my close and extended family.

This dataset contains the survey responses regarding the many types of fitness routines that people participate in.

What exactly is contained in the dataset?

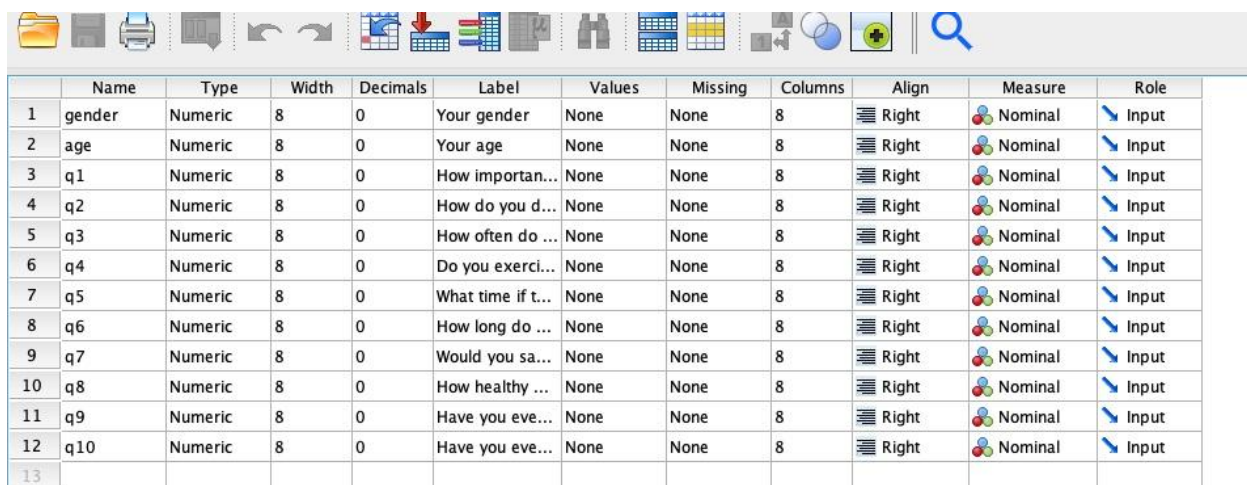
This dataset contains information such as :

1. Name of the individual participating in the survey.
2. The participant's gender if they attended the survey.
3. The participant's age when they attended the survey
4. On a scale from one to five, how vital is it to you to get some exercise?
5. How would you characterize your level of fitness at the moment? - Excellent, Very good, Good, Acceptable, Inadequate, and Unfit
6. How frequently do you go to the gym?
- Once each day, once or twice per week, once or twice per week, once or twice per week, three to four times per week, five to six times per week, and never.

Data Normalization

Due to the nature of data being in a descriptive format, data has to be normalized to be in numeric form for system analysis. Normalization is the process of structuring a relational database in accordance with a series of normal forms in order to reduce data redundancy and also improve data integrity. .

Using SPSS, a data analysis tool that provides clear and detailed analysis operations for both bivariate and statistics, it also serve as a means to identify numeric outcome/predictions and groups.



	Name	Type	Width	Decimals	Label	Values	Missing	Columns	Align	Measure	Role
1	gender	Numeric	8	0	Your gender	None	None	8	Right	Nominal	Input
2	age	Numeric	8	0	Your age	None	None	8	Right	Nominal	Input
3	q1	Numeric	8	0	How importan...	None	None	8	Right	Nominal	Input
4	q2	Numeric	8	0	How do you d...	None	None	8	Right	Nominal	Input
5	q3	Numeric	8	0	How often do ...	None	None	8	Right	Nominal	Input
6	q4	Numeric	8	0	Do you exerci...	None	None	8	Right	Nominal	Input
7	q5	Numeric	8	0	What time if t...	None	None	8	Right	Nominal	Input
8	q6	Numeric	8	0	How long do ...	None	None	8	Right	Nominal	Input
9	q7	Numeric	8	0	Would you sa...	None	None	8	Right	Nominal	Input
10	q8	Numeric	8	0	How healthy ...	None	None	8	Right	Nominal	Input
11	q9	Numeric	8	0	Have you eve...	None	None	8	Right	Nominal	Input
12	q10	Numeric	8	0	Have you eve...	None	None	8	Right	Nominal	Input
13											

Fig 3 Data variables and their types after normalization using SPSS

Experimentation

The data set, which was used in this study, contains information on the user's identity, age, size, height, workout time, and other relevant questions. Following tables show the demography of

respondents with the help of the descriptive statistics of the demographic variables. This information is also known as measure of central tendency (MCT).

Descriptive Statistics

Descriptive Statistics					
	No	Minimum	Maximum	Mean	Std. Deviation
Your gender	545	0	1	.55	.498
Your age	545	1	5	2.33	1.382
How important is exercise to you ?	545	1	5	3.88	.998
How do you describe your current level of fitness ?	545	1	5	2.17	1.282
How often do you exercise?	545	1	6	3.34	1.940
Do you exercise _____ ?	545	1	5	1.96	1.198
What time if the day do you prefer to exercise?	545	1	3	1.88	.984
How long do you spend exercising per day ?	545	1	5	3.03	1.578
Would you say you eat a healthy balanced diet ?	545	1	3	2.02	.633
How healthy do you consider yourself?	545	1	5	3.26	.793
Have you ever recommended your friends to follow a fitness routine?	545	1	2	1.36	.479
Have you ever purchased a fitness equipment?	545	1	2	1.62	.485
Valid N (listwise)	545				

Table 4 showing descriptive statistics of Data

The measure of central tendency shows the pattern of the data. In the above table the gender has a mean value of 0.55 and it deviates from mean with 0.49 units. Similarly, the mean of age is 2.33 and it deviates with a margin of 1.38 units. It is clear from the above table that the deviation

of every variable involved in the study from mean is less than its value. The two tables below show the frequency of the individuals who took part in the study on the basis of their gender and age along with the curved graphs.

Frequency Tables

		Your gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	243	44.6	44.6	44.6
	1	302	55.4	55.4	100.0
	Total	545	100.0	100.0	

Table 5 showing frequency ratio in gender

The above table shows that there are 44.6% male and 55.4% females who do exercise on daily basis.

		Your age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	167	30.6	30.6	30.6
	2	236	43.3	43.3	73.9
	3	20	3.7	3.7	77.6
	4	37	6.8	6.8	84.4
	5	85	15.6	15.6	100.0
	Total	545	100.0	100.0	

Table 6 shows frequency ratio in age

The table shows that 30.6% individuals who took part belongs from the age range of 15-18, 43.3% belongs to the age from 19-25, 3.7% belongs from 26-30 age range, 6.8% are from the

age range of 30-40 and 15.6% are above the age of 40. This pattern shows that the highest individuals who do exercise are youngsters are after them, the second highest are aged ones.

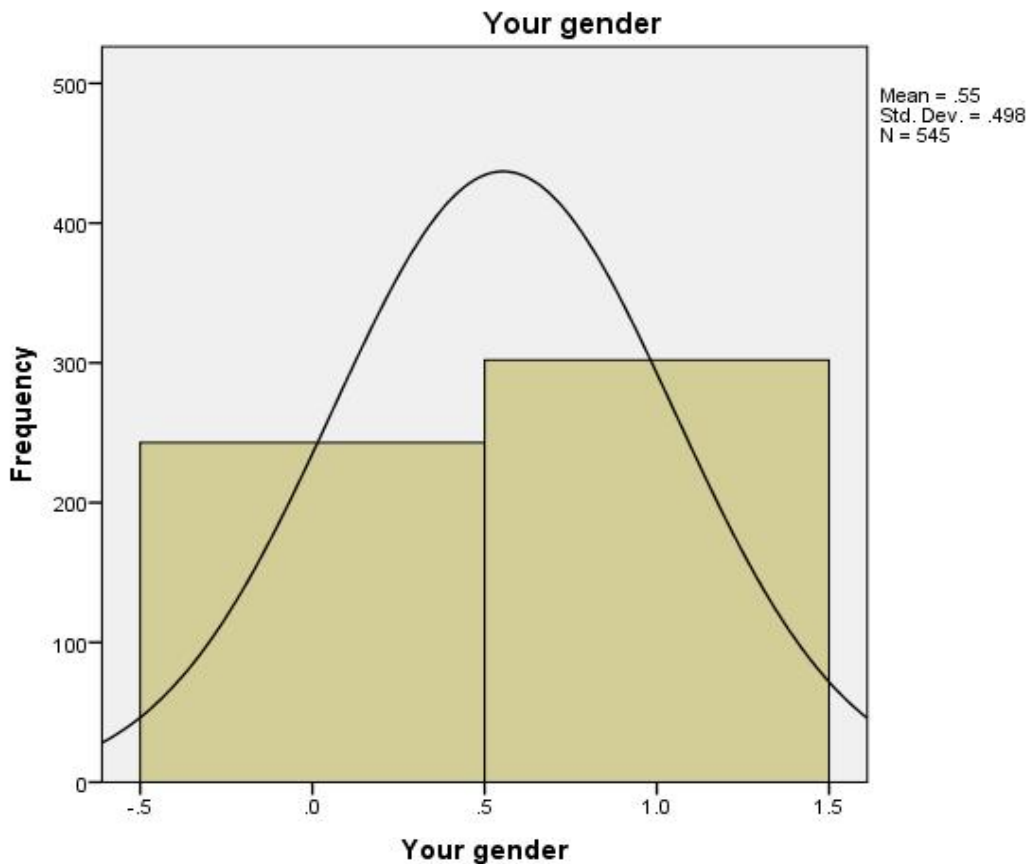


Fig 7 shows the gender information

The graph of gender is showing a symmetric curve, verifying the normal distribution of the variable. This factor is also proved by the mean value of the variable as it is lying in the centre of the scale 0-1.

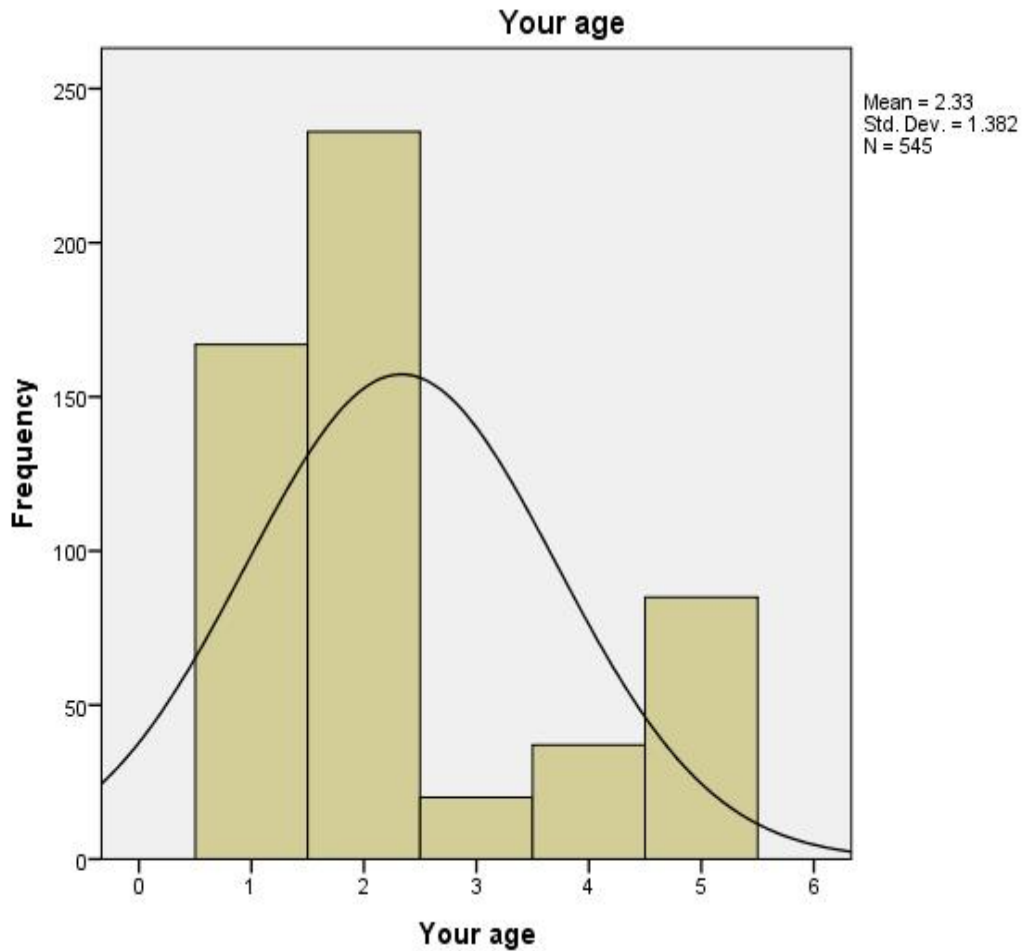


Fig 8 shows Age data info

The pattern of the age variable is showing a positively skewed curve. The regression model between age and gender of the respondents as independent variables and exercise time per day as dependent variable is presented in the table below:

Regression Models

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.229 ^a	.052	.049	1.539

- a. Predictors: (Constant), Your age , Your gender
 b. Dependent Variable: How long do you spend exercising per day ?
Fig 9 - Regression model between age vs number

The value of R in this table of model summary shows the simple correlation of the variables, which in this case is weak as the value is 0.22. The second value is R-square which is showing a variation in total in a dependent variable which can be justified by the independent variables. This variation in this case is 5.2%.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	70.971	2	35.486	14.984	.000 ^b
	Residual	1283.616	542	2.368		
	Total	1354.587	544			

- a. Dependent Variable: How long do you spend exercising per day ?
 b. Predictors: (Constant), Your age , Your gender

Table 10 showing model strength

The ANOVA table shows the goodness or the significance of the model applied. In this case, the significance value is 0.000 which is clearly less than 0.05 (significance level). Therefore, it is concluded that the model is a good fit for the data or this model of regression is statistically significant.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.601	.155		16.763	.000	2.296	2.906
Your gender	.728	.133	.230	5.462	.000	.466	.990

Your age	.010	.048	.009	.206	.837	-.084	.104
----------	------	------	------	------	------	-------	------

a. Dependent Variable: How long do you spend exercising per day ?

Table 11 shows coefficient on time spent daily exercising

The coefficient table is used to bring a regression line. With the help of this table it can be concluded that there will be a rise in the work out time with the rise of 0.728 units in the gender variable. Similarly, there will be a rise in the dependent variable with the 0.010 unit rise in the age variable. This table also shows through significance value that variable of gender is contributing significantly in the results of dependent variable whereas, age is not. Similarly, the tables below show the regression model between age and gender with the dependent variable, which is the current fitness level of the individuals.

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.108 ^a	.012	.008	1.277

a. Predictors: (Constant), Your age , Your gender

b. Dependent Variable: How do you describe your current level of fitness ?

Table 12 shows model applied on Fitness level

The value of R in this table of model summary is showing the simple correlation of the variables, which in this case is weak as the value is 0.108. The second value is R-square which shows a variation in total in a dependent variable which can be justified by the independent variables. This variation in this case is 1.2%. the adjusted R-square is just a modified form of R-square.

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
-------	----------------	----	-------------	---	------

1	Regression	10.514	2	5.257	3.223	.041 ^b
	Residual	883.927	542	1.631		
	Total	894.440	544			

a. Dependent Variable: How do you describe your current level of fitness ?

b. Predictors: (Constant), Your age , Your gender

Table 13 shows strength of the model applied on fitness level

The ANOVA table shows the goodness or the significance of the model applied. In this case, the significance value is 0.04 which is clearly less than 0.05 (significance level). Therefore, it is concluded that the model is a good fit for the data or this model of regression is statistically significant.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
1 (Constant)	2.462	.129		19.122	.000	2.209	2.715
Your gender	-.218	.111	-.085	-1.974	.049	-.436	-.001
Your age	-.071	.040	-.077	-1.793	.074	-.150	.007

a. Dependent Variable: How do you describe your current level of fitness ?

Table 14 shows coefficient on fitness level

The coefficient table is used to bring a regression line. With the help of this table it can be concluded that there will be a decrease in the fitness level with the rise of 0.218 units in the gender variable. Similarly, there will be a decrease in the dependent variable with the 0.071 unit rise in the age variable. This table also shows through significance value that variable of gender is contributing significantly in the results of dependent variable whereas, age is not.

Application development

Requirements

The requirement.txt file is a type of file in Python that often includes information about all the packages, libraries and modules necessary to construct a certain project. Additionally, it keeps all packages and files that the project depends on or needs to run.

```
autopep8==1.6.0
click==8.0.3
Flask==2.0.2
Flask-WTF==1.0.0
itsdangerous==2.0.1
Jinja2==3.0.3
MarkupSafe==2.0.1
pycodestyle==2.8.0
toml==0.10.2
Werkzeug==2.0.2
WTForms==3.0.1
```

Fig 15 shows application code requirements

Forms.py

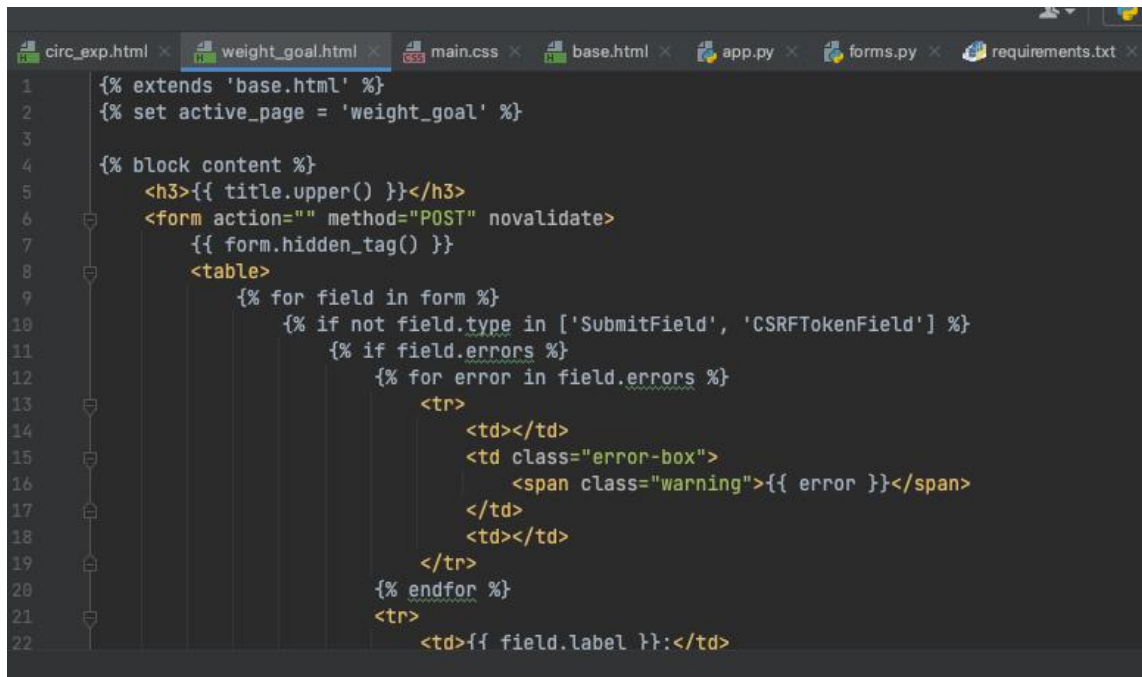
The django documentation recommends placing all of your form codes in a file in order to make your code readily manageable and processable. Our documentation forms are stored in this python file. Additionally, since this is a convention indicated in the documentation, it facilitates collaboration, as people will expect to see your code processing with forms in this location.

It takes in details and information of prospective users in order to successfully manage goal according to user.

Templates

Here, the calculation of processed data in order to make new data-driven decisions are embedded. Using machine learning, specific features that relating to producing user's goal are defined.

Information such as body fat, body weight and so on are being processed here for better output accuracy.



```

1  {% extends 'base.html' %}
2  {% set active_page = 'weight_goal' %}
3
4  {% block content %}
5      <h3>{{ title.upper() }}</h3>
6      <form action="" method="POST" novalidate>
7          {{ form.hidden_tag() }}
8          <table>
9              {% for field in form %}
10                 {% if not field.type in ['SubmitField', 'CSRFTokenField'] %}
11                     {% if field.errors %}
12                         {% for error in field.errors %}
13                             <tr>
14                                 <td></td>
15                                 <td class="error-box">
16                                     <span class="warning">{{ error }}</span>
17                                 </td>
18                                 <td></td>
19                             </tr>
20                         {% endfor %}
21                     <tr>
22                         <td>{{ field.label }}</td>

```

Fig 16 shows the code-lines applied to the weight goal template

Main.Css

Using Css(Cascading style sheet) as the language for the Web page. I used CSS as it is a simple programming language.I used the Main.Css to utilize the set of style in web pages that contain HTML components. It sets the foundation tone, text dimension, text style family, variety,etc ... of the components on a the fitness page in order to simplify our process..

```

1  body {
2      font-family: 'Source Sans Pro', sans-serif;
3      font-size: 14px;
4      color: #222222;
5  }
6
7  table {
8      width: 100%;
9      white-space: nowrap;
10 }
11
12 input, select {
13     font-family: 'Libre Franklin', sans-serif;
14     padding: 8px 10px 8px 10px;
15     font-size: 13px;
16     border: 1px solid #EEEEEE;
17     box-sizing: border-box;
18     width: 100%;
19 }
20

```

Fig 17 shows main.css file used to style sheet

App.Py

This part of the work controls the functionality of the application. It has the summary of every contribution and input of back-end user to be able to effectively run and produce an appealing and accurate front-end experience for user satisfaction.

It contains functions used to call the codes written to process and analyze data and then produce something to user.

```

from datetime import date
from math import log, log10, sqrt
from statistics import geometric_mean

from flask import Flask, redirect, render_template, url_for
from forms import (AbsPowerCalculatorForm, BodyAttrCalculatorForm,
                  BodyFatCalculatorForm, CircExpCalculatorForm,
                  WeightGoalCalculatorForm)

app = Flask(__name__)
app.config['SECRET_KEY'] = '8746f582de105b3c3f2a7edc2e85ea49'

DIFF_REL = 0.31731050786291404
DIFF_ABS = 28

@app.route('/')
def index():
    return redirect(url_for('weight_goal'))

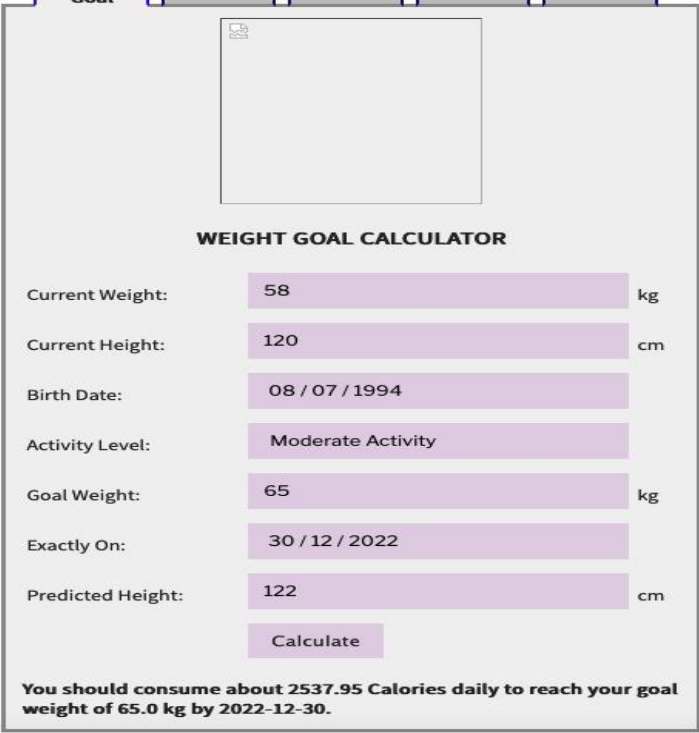
@app.route('/weight_goal', methods=['GET', 'POST'])
def weight_goal():
    title = 'Weight Goal Calculator'
    form = WeightGoalCalculatorForm()
    result = None
    if form.validate_on_submit():
        curr_age = (date.today() - form.birth_date.data).days
        goal_age = (form.at_time.data - form.birth_date.data).days
        days_to_goal = goal_age - curr_age
        act_level = form.act_level.data
        curr_weight = form.curr_weight.data
        curr_height = form.curr_height.data
        goal_weight = form.goal_weight.data
        pred_height = form.pred_height.data
        p_bow = act_level * ((1 / 73) * ( 8758 * (curr_weight + goal_weight)

```

Fig 18 shows app.py

The diagram below shows what happens when you attempt to use the web application.

It comes up with the designed application page and asks user to input details depending on what they'll like to predict or know concerning their bodies. In the example below, user attempts to predict their body weight and given a feedback on their the best thing to do to gain more weight as intended by user .The application suggests user should consume more weight and at a particular time, result will be achieved.



WEIGHT GOAL CALCULATOR

Current Weight:	58	kg
Current Height:	120	cm
Birth Date:	08 / 07 / 1994	
Activity Level:	Moderate Activity	
Goal Weight:	65	kg
Exactly On:	30 / 12 / 2022	
Predicted Height:	122	cm

Calculate

You should consume about 2537.95 Calories daily to reach your goal weight of 65.0 kg by 2022-12-30.

Fig 19 shows web application prediction

Discussion

Personal training - which has long been a core part of the fitness business - has traditionally been a very complex person-to-person experience. Regardless, AI-focused startups are starting to corner the market, making personal training immediately available and affordable.

Organizations like Shft already offer AI-powered digital coaching apps to focus on how individuals work and deliver modified workouts and motivation based on their fitness goals. These mobile health apps allow for flexibility -- clients can stay healthy when it's useful, rather than working on a human coach's schedule.

Individuals are increasingly turning to technology to help them achieve well-being. Numerous fitness apps, fitness center managers, devices, and wearables are hitting the market and making waves. It shouldn't surprise me when I say artificial brain power has become a huge part of the fitness business.

Whether or not your fitness club uses AI, AI is changing the business of healthcare. Looking at the further development of incentives and transaction options, AI is currently being used to reshape personal habits. For example, artificial intelligence can undoubtedly track healthy behavioral patterns and patterns of boring activities, and use this data to guide you through the fitness process.

In fact, a new report from Research N Reports shows that the value of the global fitness technology market is estimated to grow from \$17.9 billion in 2019 to \$62.1 billion in 2025. You may not be able to consistently understand man-made. Reasoning (AI) is better suited to our way of life.

A 2017 statistical survey by ReportLinker estimated that the global digital fitness industry will grow 33% to \$27.4 billion by 2022, which is a good (that is to say least) tendency judging by COVID-19's mega-training spree entering the digital realm to meet this prediction. Currently, A.I. is used to make home workouts safer, more personalized, and as close to the studio experience as one would expect (and more appealing, since the ability to access fitness centers or fitness classes won't appear anytime in the future). Trend-setting AI is in two important ways:

transforming technology through apps and fitness devices, and delivering personalized service by understanding your activity and recovery behavior.

Planet Fitness develops artificial intelligence applications related to fitness equipment in fitness centers to provide customers with more personalized fitness instructions through various channels. The app helps customers figure out how to properly use different machines and equipment, and provides specific motivation and re-workouts. Customization allows customers to practice at their own pace without feeling compelled or humiliated to evaluate new hardware, while maintaining legal structure, safety, and technology.

Additionally, Under Armour has partnered with IBM's Watson to develop the UA Record app, which guides and guides individuals on their activity levels and routines, including fitness, nutrition and rest. Supported by mental enhancement, the app can recreate fitness plans for individual clients, track food consumption through PC vision innovations, and suggest workouts based on nearby climate, perceptibility, and objective guidance. Early adopters of the technology include Tempo, a related device that consists of a self-contained warehouse that holds loads and has a giant screen in front. It is both camera-enhanced, providing structural input via a 3D light pulse sensor, continuously monitoring the client's movement multiple times, and controlled by AI technology that allows it to recommend the appropriate payload for various events. AI in fitness is being dispatched to further boost revenue and consumer loyalty. Recreation centers and wellness centers, especially small store fitness centers, generate vast amounts of data that are often understudied. As AI advances, managers can actually further explore this data for a broader profile of customers, including orientation, age and preferred exercise, to decide what can contribute to club revenue.

AI-powered trading devices provide clients with hyper-personalized communications. Health centers can only issue bot notifications using customer profile data close to an AI model trained on the behavior of individual parts. With robust profile data, clubs can more easily grasp individual needs, gain a more complete understanding of customers, and make clear contributions that result in the highest return on investment.

Over the past two years, the brand has seen a 1,000% increase in deal volume and closed a \$220 million Series C to fuel interest. For now, Tempo aims to reach more people with more affordable offerings in 2022: a new “Move” framework (\$39 per month for sign-up, \$39 per month), in-office in low, abundance Scheduled at full capacity and by pairing with your iPhone or TV, it follows a similar structure to provide personalized workout recommendations at the cost of 6 to 6 as the brand's unique hardware.

Additionally, the aforementioned MIRROR swam to the area in November, delivering the associated free weights and calf loads. These trims are paired with gadgets that provide rep tracking, build changes and weight recommendations. Then there's the fitness industry's latest unicorn, Tonal, a related digital weight machine that debuted in 2018. Last year, Tonal introduced a “structural critique” feature that works with sensors to guide development and follow on-screen exercises. to your technology. In 2021, the brand raised \$250 million, including initiatives from big title sponsors like talented rivals LeBron James, Serena Williams and Sue Bird. A year later, the organization plans to open another creative studio in New York (regardless of what it currently owns in Los Angeles), and will continue to expand its live and on-demand contributions by hiring more coaches and using their ongoing work. Executive Open Education Program. (Williams' tennis illustration, may we suggest?)

While the aforementioned brands have integrated tech follower structures into their devices, others have focused on enabling customers to engage in similar interactions with just a phone, an Internet Society and a few feet of floor space. For example, Onyx uses artificial intelligence to turn your iPhone camera into a 3D motion tracker, and recently relaunched its iPhone app tracker with no subscription fees. A year later, the phase is designed to provide more detailed metrics so customers are more likely to see their progress over time.

Likewise, CoPilot (formerly DeltaTrainer) uses both technology to follow the action and a live trainer to give you unlimited re-instructions for \$99 per month; the app interacts with your smartwatch to capture your progress and information is passed to your instructor so that he or she can provide real-time input. In May, the brand announced that it would use the \$3.3 million raised in a seed round to grow its team, hire more trainers and acquire new clients over the coming year. AI in fitness is being dispatched to further boost revenue and consumer loyalty. Fitness centers and wellness centers, especially small store fitness centers, generate large amounts of data, which are often incomplete. As AI advances, boards can more successfully examine this data for a more comprehensive profile of clients, including orientation, age and preferred exercise, to decide what can contribute to the club's revenue.

AI-powered trading devices provide clients with hyper-personalized communications. Health centers can use customer profile data close to AI models that are trained on the behavior of individual parts to make unique robotic notifications. With robust profile data, clubs can more easily grasp individual needs, gain a more complete understanding of customers, and make clear contributions that result in the highest return on investment.

Honestly, A.I. is nothing new, but it's been causing a stir in the fitness world lately. "Artificial intelligence is driven by looking at your data and how you can make recommendations that

might work for you,” said Mo Iqbal, organizer and CEO of Sweatworks, a digital product development organization that works with fitness brands to develop technology. application. Data diversification is usually done through a wearable device that collects your tools and rests and utilizes artificial intelligence, over time, it can detect your work during your workout by learning your body behavior and changing your input based on that behavior pattern how hard it is. “This criticism is constantly changing,” Iqbal said. Take the wearable Whoop, for example: the app can spice up your show right from the start by comparing you to the rest of your cohort, but in the long run, thanks to artificial intelligence, it can actually Figure out what your situation is doing. I'll answer and how to get you back to a good place.

Some kind of artificial intelligence A technology that uses complex calculations to track data design is called artificial intelligence, in other words, personalized exercise recommendations. It's worth stopping here to explain artificial intelligence. At its most basic level, it's a very advanced form of computing (think: computing is a caterpillar, artificial intelligence is a butterfly). “Advanced competitors have the opportunity to see what coaches are doing,” said Trent Ward, Forme Life's pioneer and CEO. Build reviews and personalized workout tips (estimate from \$58/month for a fairly long time only in screen studios, or \$110/month for a fairly long time for a full studio with sports trim from US dollars). “With AI, this kind of offer and key backed advice is now available to typical buyer competitors.” The data gathered analysed above with the help of SPSS is by applying regression model is showing a significant result. This analysis is accurate for the data because it is clear with the significance value that the model is a good fit for the data gathered.

Chapter V: Conclusion & Limitations

The vast majority of the individuals must promote social seclusion and be confined to their homes in order to keep the contagious virus (COVID-19) under control. All public activities are prohibited throughout the pandemic, which may have a detrimental effect on people's physical and emotional health. Diet, exercise, and the overall health of the general public are all directly related. A tailored health app powered by AI is created to improve a citizen's physical and emotional well-being. The entire system is created to provide recommendations about what foods to eat to boost defense based on their health status and to provide basic workouts and asana to enhance their general physical health by resolving concerns with mental health during this type of lock down. People with respiratory disorders, people over the age of 65, and individuals who struggle from high blood pressure, hyperglycemia, or coronary heart disease (CVD) are among the beneficiaries of this application. This would enable the family to live a peaceful and enjoyable life by maintaining or improving both their bodily and psychological well-being. The major goal is to recommend sufficient nutrients via straightforward prepared meals to increase citizens' mental and physical fitness and tolerance for all demographic groups on the basis of their age and current health. Applications increase client engagement because they are always accessible to the customer.

With the general rise of virtual collaborators and chatbot application, the focus on health and well-being is also benefiting from this device. Customer support chatbots answer any questions and allow agents to assist with higher value or humanitarian causes. While this is premium hardware (\$2,995 in addition to the \$49 monthly registration fee), there are more affordable sports apps that do the same. The recently given Yoganotch (\$249) offers a wearable 3D motion sensor to guide you through the giveaway, while Onyx (\$80 for lifetime recording) and Cure.fit

(free for the rest of October) use the camera from your phone. Capture 3D motion pictures to review your development and come up with structural ideas when things go wrong.

It has been concluded that using this building-enhancing technique will be the way to overcome the difficult times in the post-pandemic fitness world, especially as many people's adoption of home exercises has taken root. At this point, for a while, many industry geniuses (including Good+Good!) predicted that on the other side of the quarantine, we would have an omnichannel approach to fitness, with fitness studios offering IRL and digital classes. is artificial intelligence. It's evolving right now: helping you work harder, better and smarter. With your phone and PC, you can truly have everything you need to stay fit at home.

Chatbots can work every day, every day, in a good, empowering tone, and can be a more approachable option for those just starting out in the fitness process who aren't afraid to clarify pressing questions. Virtual assistants are also ready to provide clients with clear guidelines and development ideas to improve their build or address certain habits.

In addition, people with health problems can access new equipment, support and therapy, just like virtual companion training. Virtual partners provide round-the-clock support and can treat patients in need of care, but may be too shy to consider discussing their interests with individuals. Treatment can range from a holistic approach to general health and well-being to complex issues and panes of infection.

The global fitness industry is a huge market, with fitness clubs, in-store fitness centers, and a variety of health and wellness apps and wearables popping up all the time. Currently, with the rates of overweight and obesity increasing globally, people are looking for devices and developments to help them lose weight and stay fit. The reason to use this technique is that when you do the right exercise for your body on a given day, you're also better able to do it right.

When you don't use the proper structure, AI variation can help you observe your edits and how you perform certain actions. In the middle of this year, digital strength training weight frame Tonal introduced structural criticism highlights that use sensors inside the machine's smart grips and smart bars to guide you through your development (entries appear on the screen to let you know how to change your photos with similar structures and legal structures).

The application of AI to fitness equipment has proven valuable so far, and the positive impact should only increase as developments such as AI-powered digital coaching continue to gain traction. Of course, industry-focused AI-powered fitness apps are gaining a foothold as buyers continue to choose to practice or progress at home. In addition, in the long run, artificial intelligence becomes more integrated and allows exercise as well as fitness classes. As technology advances, technology has also been outfitted with mechanized trainers, an example of how AI can push the healthcare business forward. As the world changes by the elements, artificial intelligence becomes a reality and a core part of the fitness business. Whether your fitness club uses artificial intelligence or not, things are different. In addition to supporting beneficial outcomes by examining health through mechanical progression over a digitally determined period, AI is increasingly being used to adjust personal habits. For standards, artificial consciousness can monitor healthy behavior patterns and boring workouts, as well as use data to aid fitness and adventure. Then artificial intelligence is changing the way we live and conduct our activities.

In the field of fitness, artificial intelligence is undoubtedly changing the field. Whether you are an entertainment center operator or a fitness enthusiast, the application of artificial intelligence will impress both players. Organizations are creating AI applications that will leverage human reasoning to provide you with constantly revised guidelines. Therefore, artificial intelligence in

fitness is broad. This is one of the latest models in the fitness industry. AI-based personal trainers will be the next big thing in the fitness industry. Apps like Sony advagym, at their most basic, use human reasoning to help clients achieve their fitness goals. Advagym has everything an individual needs to take their fitness center to the next level. The apps are designed to provide personalized fitness and lifestyle programs that individuals can use to train with or stimulate through classes, activities, and programs distributed by workout centers. Personal trainers can provide lessons, guidance and detailed training plans. Additionally, AI can be used to create a personalized fitness plan based on your goals, eating habits, current fitness level, gadget data, and different variables.

However, the app can also evaluate workouts and verify the type of fitness enthusiast. With the sports center's associated device sensors, cloud backend, and apps for fitness enthusiasts, they can be constantly criticized on a one-on-one basis. These AI-based coaching apps are designed to work together seamlessly and provide a seamless customer experience in entertainment centers and more. For example, if the person is doing squats, the app will appeal to them under the assumption that the knees are too wide or the legs are too tight.

Later, popular apps emerged as personal trainer devices, allowing experts to share training plans and training records with all fitness individuals or personal clients. Likewise, they can connect with customers remotely, no matter where they are located, for educational information and comfort. Thanks to innovation, individuals can now personalize training anytime, anywhere with technology-based trainers tailored to their health and goals.

Prep for what's in the store

Due to the ever-changing scene, it is certain that our lives are busier and we have less energy for our daily activities. However, with the rise of artificial consciousness and personal trainers, these

experiments often take place in the fitness industry. These cutting-edge gadgets and apps are designed to adjust our fitness process and increase awareness.

Additionally, some pioneering businessmen have begun to market their previously knowledgeable fitness equipment. It is also preparing for the development of future technology, making it a healthy era and a happy place. More or less, artificial brain power is improving the fitness business and impacting personal habits. AI apps in fitness apps can improve your calorie counting work and dinner schedule. Whether you're hitting a certain weight or hitting a certain fitness goal, this AI-driven diet adjustment can support you.

From tracking your progress to changing your diet on a weekly basis, the app's self-change diet calculator does it all. It works based on data collected over a specific time period. Some calorie counter apps, like FitGenie, are ideal examples of fitness apps that offer AI-driven eating ideas.

Limitations

This work is not without a limitation. The first limitation i encountered was gathering my data, i had thought organizing and giving out surveys will be easy in order to get my data. What i learnt is time goes by really quick and although this method was very useful and helpful in helping me gather my data, the time i spent waiting for feedback from people delayed me in my project work and hence i couldn't explore the full possibilities of my application design and population. I also had challenges when i decided to learn a new tool for data analysis, this was out of explorations and wanting to know something else.

I will do better with my time management and explore the more options to make the application a more reliable one.

References

- Agarwal, V., Sharma, K. and Rajpoot, A.K., 2022, May. AI based Yoga Trainer-Simplifying home yoga using mediapipe and video streaming. In *2022 3rd International Conference for Emerging Technology (INCET)* (pp. 1-5). IEEE.
- Ashrafian, A., Shokri, F., Amiri, M.J.T., Yaseen, Z.M. and Rezaie-Balf, M., 2020. Compressive strength of Foamed Cellular Lightweight Concrete simulation: New development of hybrid artificial intelligence model. *Construction and Building Materials*, 230, p.117048.
- Aslani, S., Kermani, B. and Alibeigi, S., 2016. The Artificial Intelligence of Health Sector: How to Advance based on Math and Science?. *International Journal of Modern Engineering Technologies*, 2(2).
- Bajpai, A., Jilla, V., Tiwari, V.N., Venkatesan, S.M. and Narayanan, R., 2015, August. Quantifiable fitness tracking using wearable devices. In *2015 37th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* (pp. 1633-1637). IEEE.
- Dharmaraj, V. and Vijayanand, C., 2018. Artificial intelligence (AI) in agriculture. *International Journal of Current Microbiology and Applied Sciences*, 7(12), pp.2122-2128.
- Dwivedi, Y.K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., Duan, Y., Dwivedi, R., Edwards, J., Eirug, A. and Galanos, V., 2021. Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 57, p.101994.

- Elavarasi, S.A., Jayanthi, J., Rajeswari, K.C. and Nandini, V., 2021. Ai based personalized healthcare application to keep up the well-being of people by boost the immunity through food and physical activity during pandemic. *Annals of the Romanian Society for Cell Biology*, pp.2422-2435.
- Emamgholizadeh, S. and Demneh, R.K., 2019. A comparison of artificial intelligence models for the estimation of daily suspended sediment load: a case study on the Telar and Kasilian rivers in Iran. *Water Supply*, 19(1), pp.165-178.
- Farrokhi, A., Farahbakhsh, R., Rezazadeh, J. and Minerva, R., 2021. Application of Internet of Things and artificial intelligence for smart fitness: A survey. *Computer Networks*, 189, p.107859.
- Fister Jr, I., Ljubič, K., Suganthan, P.N., Perc, M. and Fister, I., 2015. Computational intelligence in sports: challenges and opportunities within a new research domain. *Applied Mathematics and Computation*, 262, pp.178-186.
- Iliashenko, O., Bikkulova, Z. and Dubgorn, A., 2019. Opportunities and challenges of artificial intelligence in healthcare. In *E3S Web of Conferences* (Vol. 110, p. 02028). EDP Sciences.
- Lucas, G.M., Krämer, N., Peters, C., Taesch, L.S., Mell, J. and Gratch, J., 2018, November. Effects of perceived agency and message tone in responding to a virtual personal trainer. In *Proceedings of the 18th International Conference on Intelligent Virtual Agents* (pp. 247-254).
- Lv, Z., Chen, D., Lou, R. and Alazab, A., 2021. Artificial intelligence for securing industrial-based cyber-physical systems. *Future generation computer systems*, 117, pp.291-298.

- Makridakis, S., 2017. The forthcoming Artificial Intelligence (AI) revolution: Its impact on society and firms. *Futures*, 90, pp.46-60.
- Maleki, S., Moradzadeh, A., Riabi, R.G., Gholami, R. and Sadeghzadeh, F., 2014. Prediction of shear wave velocity using empirical correlations and artificial intelligence methods. *NRIAG Journal of Astronomy and Geophysics*, 3(1), pp.70-81.
- Mathew, L. and George, S., 2022. The Indian Fitness Industry: Impact of Digitalisation. In *The Digital Transformation of the Fitness Sector: A Global Perspective* (pp. 97-109). Emerald Publishing Limited.
- Mick, D.G., 2006. Meaning and mattering through transformative consumer research. *Advances in consumer research*, 33(1), pp.1-4.
- Moursund, D.G., 2004. *High tech/high touch: A computer education leadership development workshop*. D. Moursund.
- Novatchkov, H. and Baca, A., 2013. Artificial intelligence in sports on the example of weight training. *Journal of sports science & medicine*, 12(1), p.27.
- Novatchkov, H. and Baca, A., 2013. Artificial intelligence in sports on the example of weight training. *Journal of sports science & medicine*, 12(1), p.27.
- Ramchoun, H., Ghanou, Y., Ettaouil, M. and Janati Idrissi, M.A., 2016. Multilayer perceptron: Architecture optimization and training.
- Schmidt, B., Benchea, S., Eichin, R. and Meurisch, C., 2015, September. Fitness tracker or digital personal coach: how to personalize training. In *Adjunct Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2015 ACM International Symposium on Wearable Computers* (pp. 1063-1067).

- Thompson, W.R., 2018. Worldwide survey of fitness trends for 2019. *ACSM's Health & Fitness Journal*, 22(6), pp.10-17.
- Tran, T.T., Choi, J.W., Van Dang, C., SuPark, G., Baek, J.Y. and Kim, J.W., 2018, June. Recommender system with artificial intelligence for fitness assistance system. In 2018 15th International Conference on Ubiquitous Robots (UR) (pp. 489-492). IEEE.
- Vaishya, R., Javaid, M., Khan, I.H. and Haleem, A., 2020. Artificial Intelligence (AI) applications for COVID-19 pandemic. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*, 14(4), pp.337-339.
- Vijayaraghavan, V., Garg, A., Wong, C.H. and Tai, K., 2014. Estimation of mechanical properties of nanomaterials using artificial intelligence methods. *Applied Physics A*, 116(3), pp.1099-1107.
- Wang, X., 2020, November. Application of artificial intelligence technology in physical fitness test of college students. In *International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy* (pp. 56-62). Springer, Cham.
- Yong, B., Xu, Z., Wang, X., Cheng, L., Li, X., Wu, X. and Zhou, Q., 2018. IoT-based intelligent fitness system. *Journal of Parallel and Distributed Computing*, 118, pp.14-21.
- Zibakhsh, A. and Abadeh, M.S., 2013. Gene selection for cancer tumor detection using a novel memetic algorithm with a multi-view fitness function. *Engineering Applications of Artificial Intelligence*, 26(4), pp.1274-1281.