IBM

Team Number: 10

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Domain Name: Healthcare

Use case Name: AI-powered Nutrition Analyzer for Fitness Enthusiasts

Paper 1

Title: Health Analysis of Transformer Winding Insulation Through Thermal Monitoring and Fast Fourier Transform (FFT) Power Spectrum

Author: Muhammad Aslam, Inzamam Ul Haq, Muhammad Saad Rehan, Faheem Ali, Abdul Basit, Muhammad Iftikhar Khan, Muhammad Naeem Arbab.

Year: 2021

Methodology: Thermal monitoring, novel winding insulation model, thermal monitoring algorithm and installation of monitoring unit at 500 kv grid station.

Paper 2

Title: Leftovers Nutrition Prediction for Augmenting Smart Nutrition Box Prototype Feature Using Image Processing Approach and AFLE Algorithm

Authors: Yuita Arum Sari, Luthfi Maulana, Yusuf Gladiesnyah Bihanda, Jaya Mahar Maligan, Nabila Nur'aini, Dhea Rahma Widyadhana

Year: 2020

Methodology: The dataset was taken using an SNB prototype combined with full of lighting inside the box. Each item of food was placed in the compartment of the white tray box

Paper 3

Title: A Low-Cost Smart Glove System for Real-time Fitness Coaching

Authors: Yongpan Zou ,Dan Wang,Schiong Hong,Rukhsana Ruby, Dian Zhang,Kaishun Wu

Year: 2020

Methodology: Besides nutrition, strength training appeals a mushrooming number of people across all age groups, especially the youngsters. More specifically, iCoach, is a Smart fitness glove with commercial inertial measurement IMU including accelerometer, gyroscope, magnetometer embedded in its wrist band. Compared with professional coach, iCoach achieves satisfactory assessment quality.

Paper 4

Title: Physical Activity Recommendation for Exergame Player Modeling using Machine Learning Approach.

Authors: Zhao Zhao, Ali Arya, Rita Orji, Gerry Chan

Year: 2020

Methodology: Exergames are effective tools to motivate and promote daily activities. A validated design of a personalized physical activity recommender systems for exergames based on a study of participant's preferred activities. The methodology was to use the questionnaire data to train a binary predictive model to predict whether the user would like a new type of exercise or not.

Paper 5

Title: Optimizing Nutrition using Machine Learning Algorithms-a Comparative Analysis

Authors: Asmabee Khan, Sachin Deshpande, Amiya K. Tripathy

Year: 2019

Methodology: The background studies towards designing recommendation system using machine learning algorithms that lead to the design of nutrition based recommendation system.

Paper 6

Title: Emo Wei: Emotion-Oriented Personalized Weight Management System Based on Sentiment Analysis.

Authors: Jihyeon Kim, Uran Oh

Year: 2019

Methodology: To confirm the feasibility of monitoring emotion from personal logs such as online posts, using Recurrent Neural Network (RNN) based sentiment analysis on weight loss related tweets and posts from an online weight management community called FatSecret in comparison to general tweets

TABULAR FORM:

S. No.	Authors	Title	Methodology	Pros (Advantage)	Cons (Disadvantage)
1.	Muhammad Aslam, Inzamam Ul Haq, Muhammad Saad Rehan, Faheem Ali, Abdul Basit, Muhammad Iftikhar Khan, Muhammad Naeem Arbab (2021) (IEEE paper 1)	Health Analysis of Transformer Winding Insulation Through Thermal Monitoring and Fast Fourier Transform (FFT) Power Spectrum	Thermal monitoring, novel winding insulation model, thermal monitoring algorithm and installation of monitoring unit at 500 kv grid station.	The system assesses the power transformer's health status by tracking the hot-spot temperature and the transient incipient activities like partial discharges (PD) inside the winding insulation.	It requires oil and cellulose i.e., kraft paper to make the transformer so that the quality of the kraft paper must be as per the requirement.
2.	Yuita Arum Sari, Luthfi Maulana, Yusuf Gladiesnyah	Leftovers Nutrition Prediction for Augmenting Smart Nutrition Box	The dataset was taken using an SNB prototype combined with	The method was also embedded in SNB prototype to enhance the	The segmentation algorithm has drawbacks when

	Bihanda, Jaya Mahar Maligan, Nabila Nur'aini, Dhea Rahma Widyadhana (2020) (IEEE paper 2)	Prototype Feature Using Image Processing Approach and AFLE Algorithm	full of lighting inside the box. Each item of food was placed in the compartment of the white tray box.	estimation function.	applying in multiple conditions.
3.	Yongpan Zou ,Dan Wang,Schiong Hong,Rukhsana Ruby, Dian Zhang,Kaishun Wu (2020) (IEEE paper 3)	A Low-Cost Smart Glove System for Real-time Fitness Coaching	More specifically, iCoach, is a Smart fitness glove with commercial inertial measurement IMU including accelerometer, gyroscope, magnetometer embedded in its wrist band.	The detection of non-standard behaviors and quality assessment results are displayed on the user interface. The results can also be reported to users in the form of voice reminder.	The overall speed of repetition is too fast or too slow. The speed of outward and backward processes is not balanced. The repetitions are not stable with noticeable shakes.
4.	Zhao Zhao, Ali Arya, Rita Orji, Gerry Chan (2020) (IEEE paper 4)	Physical Activity Recommendation for Exergame Player Modeling using Machine Learning Approach.	The methodology was to use the questionnaire data to train a binary predictive model to predict whether the user would like a new type of exercise or not.	The feasibility of using the player model for personalizing PA, potential of using machine learning in building the recommender system for PA and the considerable effect in optimizing the system.	Sometimes it might not be realistic for some users to try those new Pas that our system recommended. The system did not look at the distance between PA with different perspectives.
5.	Asmabee Khan, Sachin Deshpande, Amiya K. Tripathy (2019) (IEEE paper 5)	Optimizing Nutrition using Machine Learning Algorithms-a Comparative Analysis	The background studies towards designing recommendation system using machine learning algorithms that lead to the design of nutrition based recommendation system.	An expert recommendation system is designed, which wills the user to assess their nutritional status and get a Web/App-based counseling from Nutritionists/Dietitian.	There must not be a lack of knowledge about proper nutrient-content diet to predict and form statistics.
6.	Jihyeon Kim, Uran Oh (2019) (IEEE paper 6)	Emo Wei: Emotion-Oriented Personalized Weight Management	To confirm the feasibility of monitoring emotion from personal logs	The paper provided design implications for future weight management	This field has not yet developed enough to grasp the situation, the

		System Based on Sentiment Analysis.	such as online posts, using Recurrent Neural Network (RNN) based sentiment analysis on weight loss related tweets and posts from an online weight management community called FatSecret in comparison to general tweets	systems to better assist people with managing not only their physical but also their emotional well-being by minimizing potential stress.	sentiment analysis module used here, has only about 80% accuracy. Moreover, people tend to write their daily diet records rather than expressing their feelings on the diet which makes sentiment analysis more difficult.