



IJIRCCCE

e-ISSN: 2320-9801 | p-ISSN: 2320-9798



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN COMPUTER & COMMUNICATION ENGINEERING

Volume 9, Issue 6, June 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.542



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Review on Smart AI Lifestyle Monitoring App

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ABSTRACT: Smart AI Lifestyle Monitoring App is a combination of different Neural Networks and Dynamic Algorithms. Combining all creates System that will monitor and help user to maintain their Lifestyle. System consists of 2 different Neural Networks and 1 complex Dynamic Algorithm. First and complex Neural Network is to predict Body Mass Index (BMI) from user's selfie (Image), It is based on VGG16 which is Convolutional Neural Network (CNN). Second Neural Network is to predict Health Score from various input from users as well as from android device sensors, it is based on Deep Neural Network (DNN). Third is Dynamic Algorithm which is used to read and rectify pedometer sensor data more accurately. The system will help to predict any Chronic diseases based different factors observed by the System over specific time period. Also, the app will take survey from user after specific time interval to generate report on user's health and it will also schedule Food intake, Water Intake and to notify inactivity as well as exercise.

KEYWORDS- VGG-16 CNN, Java, Android, Python, Body Mass Index (BMI), Machine Learning, Deep Neural Network

I.INTRODUCTION

To combine and integrate different Neural Networks and Dynamic Algorithm to monitor user's Life-style, Daily activity and according to that predict Health Score of the user as well as predict BMI from image in single Android Application. Also, to process raw data from pedometer to be more accurate and only count when user is walking or running as well as to create schedule of Food and Water intake, exercise timings and inactivity. As an important application of medical informatization, healthcare big data analysis has been extensively researched in the fields of intelligent consultation, disease diagnosis, intelligent question-answering doctors, fitness scores, and medical assistant decision support, and has made many achievements. In order to improve the comprehensiveness and pertinence of the medical examination, this paper intends to use healthcare big data analysis combined with deep learning technology to provide people with a way to improve their mental and physical well-being in a long run which is usually neglected for lacking of professional knowledge, so that people can take precautions to prevent health condition from deteriorating. Inspired by the existing recommendation methods, this paper proposes a custom deep-learning-based hybrid recommendation algorithm.



II.LITERATURE SURVEY

Sr. no.	Paper Name	Author Name	Year	Outline	Advantages
1	HCP: A flexible CNN framework for multi-label image classification	Y. C. Wei, W. Xia, M. Lin, J. Huang, and B. Ni	IEEE Trans. Pattern Anal. Mach. Intell., vol. 38, no. 9, pp. 1901–1907, Sep. 2016	In this paper, they propose a flexible deep CNN infrastructure, called Hypotheses-CNN-Pooling (HCP), where an arbitrary number of object segment hypotheses are taken as the inputs, then a shared CNN is connected with each hypothesis, and finally the CNN output results from different hypotheses are aggregated with max pooling to produce the ultimate multi-label predictions.	1) No ground-truth bounding box information is required for training. 2) The whole HCP infrastructure is robust to possibly noisy and/or redundant hypotheses. 3) The shared CNN is flexible and can be well pre-trained with a large-scale single-label image dataset, e.g., ImageNet
2	Machine Learning based Health Prediction System using IBM Cloud as PaaS	Neloy, Asif & Alam, Sazid & Bindu, Rafia & Moni, Nusrat	444-450. 10.1109/ICOEI.2019	This paper proposed machine learning technique to predict condition of critical patients. In relatively poor areas there are no modern facilities so to help doctors to monitor condition of the critical patients. The system works by taking feedback from the sensors which then processed by the pretrained Neural Network, then that neural network predicts the condition of the person.	1. Helpful in village areas with less availability of equipment. 2. Doctors can observe critical patients more efficiently. 3. More accurate due to use of the sensors feedback. 4. Can monitor 24/7.
3	Designing Disease Prediction Model Using Machine Learning Approach	Dahiwade, D., Patle, G., & Meshram, E.	IEEE Xplore/2019	Proposed general disease prediction, in which the living habits of person and checkup information consider for the accurate prediction It also computes the risk associated with general disease	1) Low time consumption. 2) Minimal cost possible. 3) The accuracy of disease prediction is 84.5%.
4	Chatbot for Disease Prediction	Mathew, R. B., Varghese, S., Joy, S. E.,	IEEE/2019	This paper explained a medical chatbot which can be used to replace the conventional method	1) This system helps in reducing conduction of daily check-ups.

	and Treatment Recommendation using Machine Learning	& Alex, S. S.		of disease diagnosis and treatment recommendation. Chatbot can act as a doctor.	2) It identifies the symptoms and gives proper diagnosis. 3) Chatbot doesn't require the help of physician. 4) The chat and user's relation are completely personal which helps users to be more open with their health matters.
5	Smart Health Monitoring System using IOT and Machine Learning Techniques	Pandey, H., & Prabha, S.	IEEE/2020	This paper deal with IoT which helps to record the real time (patient) data using pulse rate sensor and Arduino and is recorded using thing speak. Machine learning algorithms were used to make prediction of heart disease.	1) The proposed system helps patient to predict heart disease in early stages. 2) It will be helpful for mass screening system in villages where hospital facilities are not available.

III.SYSTEM ARCHITECTURE

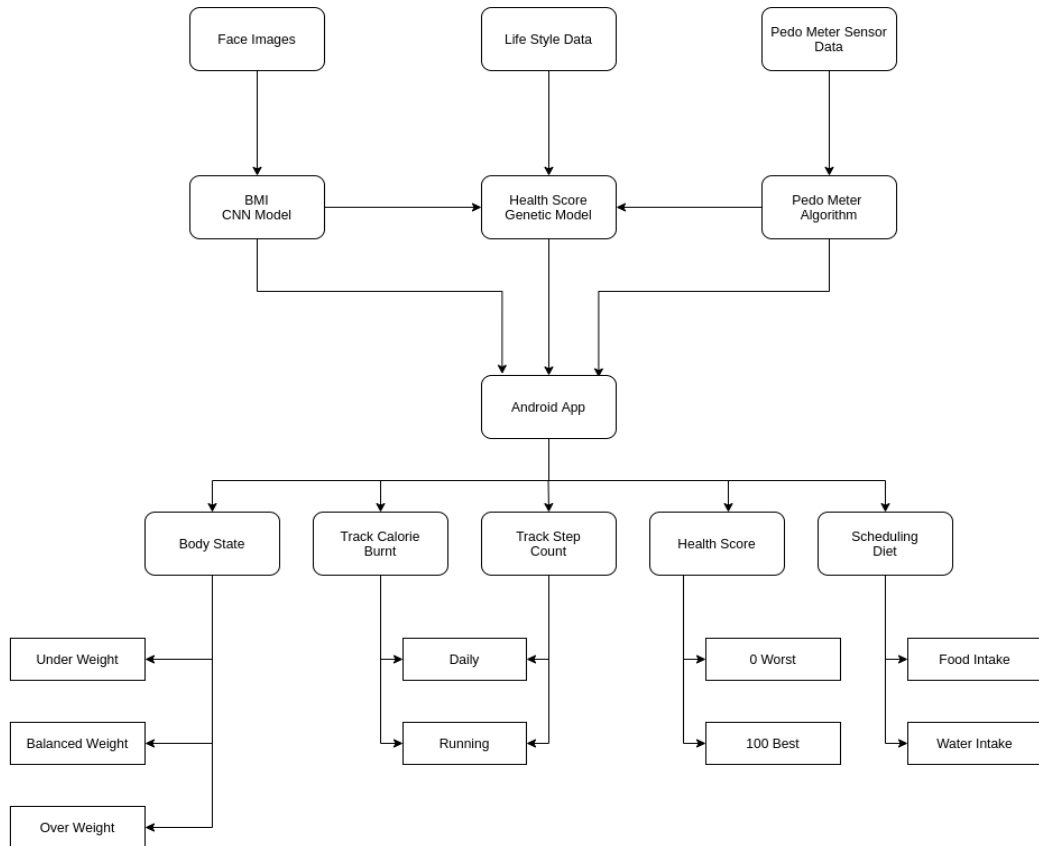


Fig 1 App Architecture

The System architecture is the conceptual model that defines the structure, behavior, and more views of a system. The application consists different Neural Networks which requires different types of inputs. Following table describes different inputs for different individual systems. The BMI system will take selfie as an input and CNN (Modified VGG16) module process that image to extract all the features and according to those features it will predict raw output on BMI score of the user. Our modified VGG16 consists many Conv2D and Max-Pooling layers to reduce and extract the feature set from the image. Health Score Model is Deep Neural Network which takes different inputs to predict Health Score. It consists many Dense layers with different node counts, activation functions and drop-outs.

The dynamic algorithm is used to process raw output from pedo-meter sensor. Then this raw data is processed and saved on daily basis. This system tracks daily step count and calorie burn as well, while running.

III. CONCLUSION

We propose a general lifestyle prediction system based on machine learning algorithm. We found that using CNN and VGG-16 algorithms we can develop an application with advanced features and can help people to monitor their own self using just their smartphones. We tried different Neural Networks for the Health Score Model viz., Feed Forward Network (Lack Diversity in input data) and RNN (Takes too many iterations to show acceptable output). For Image to BMI Model we tried, ResNet50 (Too heavy to train and not much efficient) and Custom CNN (Extracting features take large datasets and number of epochs). Finally For Health Score Model we decided to use Genetic Algorithm (It is useful for different kind of input data, Algorithm evolves around itself, adapt to input data). For Image to BMI Model, we decided VGG-16 (It is DNN in CNN, Supports RGB images, best to extract features from face, better performance). We aim to improve the accuracy of the existing modules and modify it for developing better models.

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