Yoga Asanas Contradiction Using Convolutional Neural Network

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Abstract- *Yoga is a mind and body practice. Various styles of yoga combine physical postures, breathing techniques, and meditation or relaxation. Yoga has been the subject of research in the past few decades for therapeutic purposes for modern epidemic diseases like mental stress, obesity, diabetes, hypertension, coronary heart disease, and chronic obstructive pulmonary disease. Yoga in fact means the union of individual consciousness with the supreme consciousness. Intense practice of these leads to self-realization, which is the primary goal of yoga. The improvement of technology and deep learning can help to predict the correct pose in yoga. A deep-learning algorithm that has achieved substantial results in image classification is the convolutional neural network (CNN). It is predicted that the success of the obtained results will increase if the CNN method is supported by adding extra feature extraction methods and classifying the yoga.*

Keywords- Yoga, deep learning, Tensor Flow, CN

I. INTRODUCTION

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DATA SCIENCE:

Data science is an interdisciplinary field that uses scientific methods, processes, algorithms, and systems to extract knowledge and insights from structured and unstructured data, and apply knowledge and actionable insights from data across a broad range of application domains.

The term "data science" has been traced back to 1974, when Peter Naur proposed it as an alternative name for computer science. In 1996, the International Federation of Classification Societies became the first conference to specifically feature data science as a topic. However, the definition was still in flux.

The term "data science" was first coined in 2008 by D.J. Patil, and Jeff Hammerbacher, the pioneer leads of data and analytics efforts at LinkedIn and Facebook. In less than a decade, it has become one of the hottest and most trending professions in the market.

Data science can be defined as a blend of mathematics, business acumen, tools, algorithms, and machine learning techniques, all of which help us in finding out the hidden insights or patterns from raw data which can be of major use in the formation of big business decisions.

ARTIFICIAL INTELLIGENCE:

Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. Specific applications of AI include expert systems, natural language processing, speech recognition, and machine vision.

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to the natural intelligence displayed by humans or animals. Leading AI textbooks define the field as the study of "intelligent agents", any system that perceives its environment and takes actions that maximize its chance of achieving its goals.

Artificial intelligence was founded as an academic discipline in 1956, and in the years since has experienced several waves of optimism, followed by disappointment and the loss of funding (known as an "AI winter"), followed by new approaches, success, and renewed funding.

AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No one programming language is synonymous with AI, but a few, including Python, R, and Java, are popular. In general, AI systems work by ingesting large amounts of labeled training data, analyzing the data for correlations and patterns, and using these patterns to make predictions about future states.AI programming focuses on three cognitive skills: learning, reasoning, and self-correction.

Learning processes. This aspect of AI programming focuses on acquiring data and creating rules for how to turn the data into actionable information. The rules, which are called algorithms, provide computing devices with step-by-step instructions for how to complete a specific task.

Reasoning processes. This aspect of AI programming focuses on choosing the right algorithm to reach the desired outcome.

Self-correction processes. This aspect of AI programming is designed to continually fine-tune algorithms and ensure they provide the most accurate results possible.

Artificial neural networks and deep learning artificial intelligence technologies are quickly evolving, primarily because AI processes large amounts of data much faster and makes predictions more accurately than humanly possible.

NATURAL LANGUAGE PROCESSING (NLP):

Natural language processing (NLP) allows machines to read and understand human language. A sufficiently powerful natural language processing system would enable natural-language user interfaces and the acquisition of knowledge directly from human-written sources, such as newswire texts. Some straightforward applications of natural language processing include information retrieval, text mining, question answering, and machine translation. Many current approaches use word co-occurrence frequencies to construct syntactic representations of text. "Keyword spotting" strategies for search are popular and scalable but dumb; a search query for "dog" might only match documents with the literal word "dog" and miss a document with the word "poodle". "Lexical affinity" strategies use the occurrence of words such as "accident" to assess the sentiment of a document. Modern statistical NLP approaches can combine all these strategies as well as others, and often achieve acceptable accuracy at the page or paragraph level. Beyond semantic NLP, the ultimate goal of "narrative" NLP is to embody a full understanding of commonsense reasoning. By 2019, transformer-based deep learning architectures could generate coherent text.

MACHINE LEARNING:

Machine learning is to predict the future from past data. Machine learning (ML) is a type of artificial intelligence (AI) that provides computers with the ability to learn without being explicitly programmed.

Machine learning focuses on the development of Computer Programs that can change when exposed to new data and the basics of Machine Learning, implementation of a simple machine learning algorithm using python. The process of training and prediction involves the use of specialized algorithms.

It feeds the training data to an algorithm, and the algorithm uses this training data to give predictions on new test data. Machine learning can be roughly separated into three categories. There is supervised learning, unsupervised learning, and reinforcement learning.

Supervised learning programs are both given the input data and the corresponding labeling to learn data has to be labeled by a human being beforehand. Unsupervised learning has no labels. It provided the learning algorithm.

This algorithm has to figure out the clustering of the input data. Finally, Reinforcement learning dynamically interacts with its environment and it receives positive or negative feedback to improve its performance.

Process Of Machine Learning

. RESEARCH METHODOLOGY

The proposed model is to build a classification of yoga is performed in a comparable way, which will give more accurate results. The improvement of technology and deep learning can help the yoga-doing persons without the supervision of the trainer in a more accurate way. A deep-learning algorithm that has achieved substantial results in

image segmentation and classification is the convolutional neural network (CNN).

The classification was performed using an image database that contains the correct poses of the yoga. As input, we used whole images, so it was not necessary to perform any preprocessing or segmentation of the yoga poses. Samples of more images are collected that comprise different poses of yoga. A different number of images is collected for each class that was classified into input images.

We proposed a Deep Learning (DL) based yoga prediction method to predict the result. The DL method used in the study is the Convolutional Neural Network (CNN). It is predicted that the success of the obtained results will increase if the CNN method is supported by adding extra feature extraction methods and classifying poses of yoga.

For deployment, we'll show the prediction result in the local-host web application.

MODULE DESCRIPTION:

We have to import our data set using Keras preprocessing image data generator function. We also create size, rescale, range, zoom range, and horizontal flip. Then we import our image dataset from the folder through the data generator function. Here we set the train, test, and validation. Also, we set target size, batch size, and class mode. From this function, we have to train using our own created network by adding layers of CNN.

Libraries Required:

1.TensorFlow: Just to use the tensor board to compare the loss and adam curve of our result data or obtained log.

TensorFlow is a Python library for fast numerical computing created and released by Google. It is a foundation library that can be used to create Deep Learning models directly or by using wrapper libraries that simplify the process built on top of TensorFlow

2. Keras: To pre-process the image dataset.

Keras is based on a minimal structure that provides a clean and easy way to create deep learning models based on TensorFlow or Theano. Keras is designed to quickly define deep learning models. Well, Keras is an optimal choice for deep learning applications.

3. Matplotlib: To display the result of our predictive outcome.

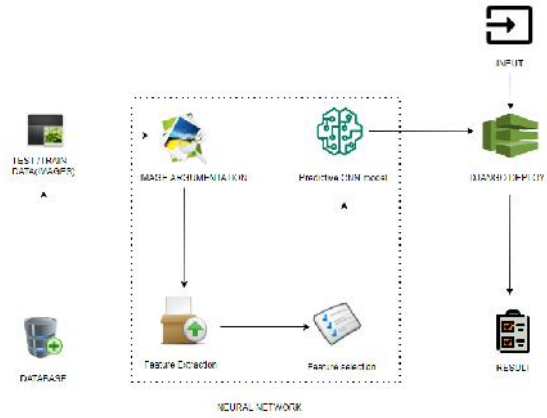
Matplotlib is one of the most popular Python packages used for data visualization. Matplotlib has a procedural interface named the Pylab, which is designed to resemble MATLAB, a proprietary programming language developed by MathWorks. Matplotlib along with NumPy can be considered the open-source equivalent of MATLAB.

4. OS:

To access the file system to read the image from the train and test directory from our machines.

The OS comes under Python's standard utility modules. This module offers a portable way of using operating system-dependent functionality.

III. SYSTEM ARCHITECTURE



DATA FLOW DIAGRAM:

A data flow diagram (DFD) is a graphical representation of the "flow" of data through an information system, modeling its process aspects.

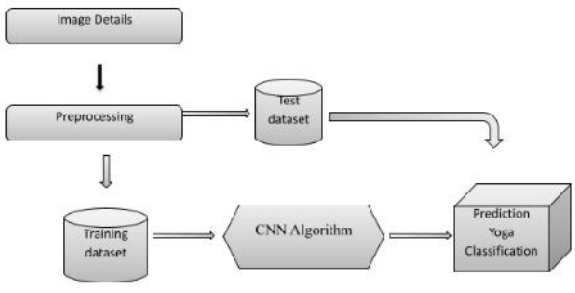
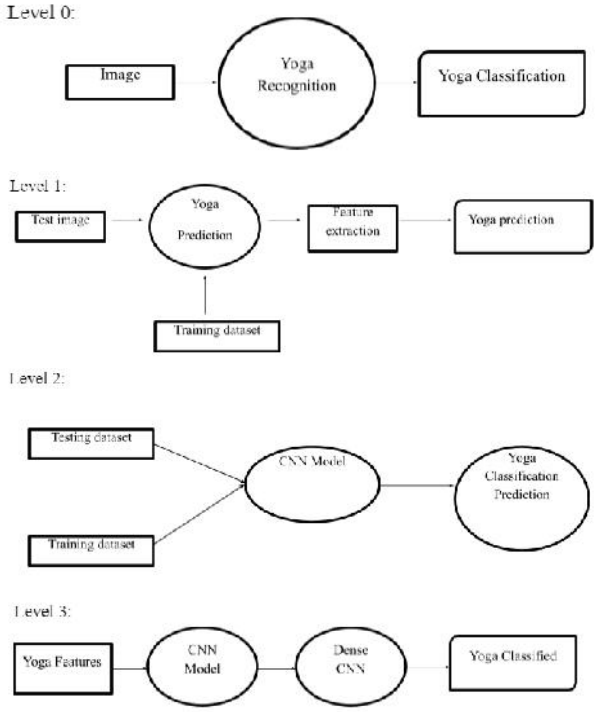


Fig: Process of data flow diagram

Data flow is the route that data takes between the external entities, processes, and data stores. It portrays the interface between the other components and is shown with arrows, typically labeled with a short data-name, like "Billing details."

DFD levels and layers A data flow diagram can dive into progressively more detail by using levels and layers, zeroing in on a particular piece. DFD levels are numbered 0, 1, or 2, and occasionally go to even Level 3 or beyond. The necessary level of detail depends on the scope of what you are trying to accomplish. DFD Level 0 is also called a Context Diagram. It's a basic overview of the whole system or process being analyzed or modeled. It's designed to be an at-a-glance view, showing the system as a single high-level process, with its relationship to external entities. It should be easily understood by a wide audience, including stakeholders, business analysts, data analysts, and developers.



IV. CONCLUSION

In this project, research to classify Yoga images over static images using deep learning techniques was developed. This is a complex problem that has already been approached several times with different techniques. While good results have been achieved using feature engineering, this project focused on feature learning, which is one of DL's promises. While feature engineering is not necessary, image pre-processing boosts classification accuracy. Hence, it reduces noise in the input data. Nowadays, facial emotion detection software includes the use of feature engineering. A solution totally based on feature learning does not seem close yet because of a major limitation. Thus, emotion classification could be achieved by means of deep learning techniques.

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