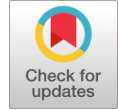


Future Trends of Artificial Intelligence in Human Biofield

Gunjan Chhabra, Ajay Prasad, Venkatadri Marriboyina



Abstract Human body structure is very complex, which contains various sub-components and makes it a complicated system. There are various activities performed by humans which involve both mental and physiological activities. Additionally, to monitor human health conditions various waves are examined like brainwaves, heart waves and others, which are highly useful in clinical scrutiny. Likewise, there exists an organized field of energy associated with every individual, termed as human biofield. This human biofield comprises of pre-eminent information about one's health and psychological state. Moreover, several studies manifested the evidences of its existence and its benefits clinically together with numerous alliances. This augments the importance of this field and reveals diversified applications in Complementary and Alternative Medicine (CAM) for humans. Contrary to other biological signals for instance ECG, EEG and other, biofield still is not being mapped i.e. no measurement techniques are available for calculating the impact of Biofield in diagnosis and therapy, due to the uneven characteristics of biofield. This research article deals with the description of hitherto journey of biofield, including its concepts, imaging and applications. Further, this paper also imparts the need of Artificial intelligence stating new opportunities and challenges associated with it. Particularly, this paper highlights the futuristic applications of biofield integrated with Artificial Intelligence.

Keywords: Human Biofield; Artificial Intelligence; Image Processing; Aura; Human Energy Field; Electromagnetic Signals; Signal Processing; Bio-informatics.

I. INTRODUCTION

From multitudinous decades the concept of human biofield has attracted many researchers to understand the mysteries and complexities of human body system. Nevertheless, human body is a complex, self-organizing, non-linear system [1]. Dynamically various expeditious changes are performed in a human body by itself functioning biologically and physiologically, which leads to the exchange of energies between organisms and environment. The energy released is termed as "biofield or human biological field" which is due the biochemical changes taking place inside the body [2] [3] [4]. Further findings manifest the presence of electromagnetic fields (EMFs) around all the living organisms and have enormous scope for applications in clinical diagnosis, therapies and clinical support for living beings. Previous researches shows the applications related to understanding of human thoughts or mental conditions, stress or depression management and many others.

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Human's processed information is not only measured by senses or clinically measured parameters, but also through their own organized energy fields, Interactions with energy fields coming from other living beings and the environment field [5]. Consequently, human biofield contains lot of information, which may facilitate the understanding of human behavior and may give directions in solving mysteries of biological and evolutionary human behavior. The notion of biofield is imperative and can be categorized as informative-energy.

Biological field consists of multifarious signals ranging from very low frequencies to optical wavelength, which are emitted by various organs and tissues. They unitedly engender large number of electromagnetic fields that are originated from the human body. Therefore, this prompt to the new interdisciplinary study, termed as Bio-electromagnetism, which is the combination of biological bodies and electromagnetic studies [6] [7]. These bio-electromagnetic field contains biological information (bio-information) explicating signs about individual's health, mind status, his or her well-being and other information. Out of all the frequency emissions, very few are being studied and used clinically. Neither the complete human biofield has been mapped nor has anyone understood the biological information associated with all the component frequencies [8] [9] [10].

As a solution, technological advancement in the field of Artificial Intelligence may provide some sort of positive denouement. Artificial intelligence (AI) is a field of computer science, which tries to imitate the human learning, understanding and other mental ability processes. Presently, field of AI provides better results than conventional programming techniques; therefore, it is being used in fields like finance, data analysis, healthcare informatics, computer vision, human computer interactions and many more. Subsequently Artificial Intelligence have huge application opportunities, providing better autonomous environment for human convenience, and supporting in the amelioration of individual's lifestyle. Notwithstanding, bioelectric field (biofield) research is very alluring yet impuissant to accomplish much success in formulating definite models. Due to the technological limitations, scientific biasing and fault hypothesis. Prevailing instruments available in the market are very expensive, less sensitive and are meagerly accurate which induces technical issues. Additionally, bio-electromagnetic field is so infinitesimal to be almost undetectable. There are multifold contrasting theories released on biofield by various researchers and scientists [11]. In the upcoming sections of this paper, contemporaneous work and related issues of biofield has been discussed. Furthermore, amalgamation of technology i.e. Artificial Intelligence (AI) and human biofield is conferred to manifest the future of biofield applications.



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Some of the AI techniques may help in sorting out the conferred issues accompanying new challenges. In particular, a method is being proposed to visualize and analyze the biofield that may help in identifying the medical and physiological behavior of an individual. This may also unveil a new revolution in medical examination and results in much more accurate predictions.

Literature Review

Research on human biofield is not so grand but with the current burgeoning of technologies, it is gathering attention. Human biofield (aura) is an ancient technique used by Vedic or Yogis to identify the health and mental condition of an individual and to attain it they used manual methodology which requires high level of trainings and learnings. In 1660, Sir Isaac Newton, discussed his views on dynamic energy field flowing in humans and accounts for life functions, which led to the revolutionary change in the study of human body. Later in 1733, English clergyman, Stephen hales declared dynamic energy field as “electricity” and nerves as “conductors”. Further research under this category ventilated to multitudinous advancements and in 1924, Willem Einthoven was awarded with the Nobel Prize for the discovery of ECG and later in the same year, Robert O. Becker deduced the connection between the psychic phenomena, limb generation, bioelectricity, and acupuncture [5].

Later in 1939, Semyon Kirlian discovered Kirlian photography, which is based on the concept of high voltage supply. The Kirlian conducted experiments in which photographic film was placed on top of a conducting plate, and another conductor was attached to a hand, a leaf or other plant material. The conductors were energized by a high-frequency high-voltage power source, producing photographic images typically showing a shadow of the object surrounded by an aura of light. Based on this method, Prof. Korotkov designed a technique called Gas Discharge Visualization (GDV) [12] [13]. This development enlightens the pathway for scientific research and gained pace. It created a baseline for various applications in medicine and biological system. Further development presented the Resonant Field Imaging (RFI) which was used for imaging bioenergy. This helps in providing information and interpretation of bioenergy field. Aura Reader Software brings new technique based on image processing and pixel value manipulation technique through which biofield imaging is possible. Farther research under this umbrella by many researchers about its history and advancements is discussed in their research articles [14] [15] [16]. Every development has its own limitations, therefore immense purview of research and development is still available.

Recent amelioration in technologies initiates new opportunities in bioinformatics and study on human biofield. Human aura contains bio-information which can be exploited for diverse applications. Study on the concept of Artificial Intelligence (AI), a sub-field of computer science, contains numerous methodologies that helps in solving complex problems. Since human biofield is one of the most complex waveform and requires complex computation techniques to decode the built-in information.

After studying the characteristics and features of human aura, it is interpreted that the human aura consists of both medical and psychological information about an individual, which can bring incredible revolution and can solve various

conundrum of human body. Due to its highly convoluted pattern and dynamic nature, it is very difficult to understand the exact information of one’s aura. Therefore, Artificial Intelligence and its sub-fields can be utilized to resolve the problems associated with visualization and interpretation of human biofield. In the below sections, applications related to human biofield in incorporation with artificial intelligence has been contemplated. Additionally, a proposed methodology is deliberated to solve the visualization and pattern generation of human biofield.

Human Biofield and Artificial Intelligence: Future trends and application

Now a days, human biofield is more fixated as it inheres a lot of information about an individual. A lot of research is happening to get abstract level of information from it and some researchers questioned its existence which makes it a controversial and debatable topic. Presently, biofield is a new area of research but remains unadorned, due to the lack of its accurate measurement devices and mathematical proofs. From last few decades, with the technological advancements, human biofield gained the attention and new aspiration of development. One of the main focussed area is Artificial Intelligence (AI), which brings out multifarious ideologies and opportunities in the field of human biofield. Brief description about the applications, opportunities and challenges has been shared in the below sections, which will help in exploring the new research areas and development in the field of human biofield and artificial intelligence.

Clinical application:

Biofield can also be used for medical well-being of an individual like other signals are used to analyze human body. In healthcare informatics, human health related data is analyzed and based on these analyzed results various predictions and outcomes are concluded. Human health related data require high amount of biological information of an individual, whereas biofield contains high amount of information related to the human body. Human biofield carries information like mental health, status of well-being, emotion, anger, stress level and many other [17]. Using AI, it is possible to design a device that must analyze the status of individual’s biofield and gives the result of individual’s well-being. For instance, imagine you have a biofield analysis device and when you wake up in the morning it captures your biofield and generates a report. This report highlights all the parameters stating your current physical and mental health related issues, including progresses or concerns, if any, based on previous evaluations. The device is smart enough to suggest an individual about their diet plan, work schedule, exercise or any other relaxation plans which should be followed in order to recover or preserve (based on status) your optimal level of health.

Furthermore, AI is efficient to handle huge database, i.e. Big Data, to perform calculations and data analysis, which constructs different types of predictions based on the stored biofield data from large dataset, using learning techniques of AI. Existing devices store lesser amount of data, which is insufficient to get higher level of results in terms of bio-information present in biofield [18].

Higher level of understanding and research needs large datasets and high level of calculus models, which is possible via artificial intelligence and machine learning techniques. These predictions will help in achieving results related to one's well-being, diagnosis of illness, supporting clinical data, balancing lifestyle, maintaining stress level, anger management, better self-analysis and many more.

Internet of Things and Wearable devices applications:

Recently, Internet of things (IoT) and wearable devices conquered huge amount of popularity. Considering IoT and wearable devices with biofield may bring new trends in the market. Suppose you have a device which accepts biofield information from your body and with a mobile application it shows the result and generates your reports. Your daily reports and results can be shared with your doctor or medical expert and by using these reports your medical expert will be able to analyze your mental and physical status and can provide valuable suggestions to you for maintaining your optimum health. This will escalate a new beginning in the field of telemedicine informatics as well [19].

Wearable devices like fit bands are commonly used for providing health related information of an individual. It collect data from human skin surface, body waves (like pulses) and surroundings to produce the result. Nevertheless, this information is not so accurate and hence one cannot completely rely on it. Human body releases electromagnetic waves, bio-electromagnetic signals, which are not mapped completely but with the help of AI whole body biofield can be mapped with other body parts which may help in better results. Recent research shows the possibility to detect dangerous diseases like breast cancer at early stage via wearable technology. These wearables analyses the skin conditions and generates the reports. However, for now only few body waves and other information is mapped in these wearables which leads to minimal accuracy. Accuracy can be enhanced by including the biofield information along with other parameters. Biofield regular monitoring of an individual may meritoriously shows the early changes in human body, which may further help an individual to enhance his or her biofield beforehand and this all will be again possible by AI based devices.

Aura as Signature

There are lot many biometric traits discovered in a human body which are the signs of identification, verification and authentication. Each biometric trait has its own assets and liabilities and are used for different applications. Now a day, multimodal biometric systems are immensely used and are under research. There are various medical issues and crimes possible while using biometric based systems. Spoofing of biometric traits is also very common which results in eminently insecure biometric security systems; therefore, multimodal-based systems are used. Another issue in such systems is the storage of biometric patterns and need of high calculations at backend. On the other hand, it has been found that human biofield has a level of extraordinary characteristic; hence, there is a possibility of treating it as a new "human signature" [2].

Benefit of making biofield as human signature is almost same as other biometric traits along but will reduce the spoofing which may decrease the related crimes and medical issues. The main challenge in this area of research is that human biofield is dynamic in nature i.e. changes its pattern

with change in thoughts, activities, and environment effects which brings up a new area of research i.e. **Aura dynamics**. With the help of AI, including image processing, human computer interaction, pattern recognition and analysis or computer vision techniques may lead to distinguish these dynamic biofield of humans from large dataset [11]. Hence human biofield can be used as a new security trait for individual's identity, authenticity and verification.

Social applications:

Human biofield research states that the biofield contains psychological information which is related to the thought process of an individual and by using this information the mental thought of an individual at a particular moment can be demonstrated. Human body generates copious frequency signals which creates various color patterns in the human biofield. These color patterns have their own meanings and further helps in classifying the state of an individual based on both, physiological and psychological well-being. For example, in human aura visualization, deep red color indicates the anger and short temper issues of an individual. These indications may help in identifying the nature and criminal attitude of an individual towards society. Again, this interpretation requires high-end analysis with huge dataset to classify such cases. Human aura dynamics with AI can induce positive outcomes in this field. By this one can easily identify the destructive nature of an individual towards society [20]. Another social application will be to classify an individual conscious state by analyzing the pattern of human aura and the variations in it, and further comparing it with past data (as recorded). Reason for unconsciousness may be alcohol intake, restlessness, high stress level and many others [21]. Suppose an individual is drunk and not in his conscious state i.e. driving vehicle of any sort is not recommended. Drinking affects the brainwaves of human beings. Still some individuals drive vehicle in such states, which is the main reason for major road accidents. One can design wearable headbands linked with the helmets, that will detect the brainwave changes as well as changes in biofield (mapping should be done to integrate both). These wearable headbands will generate a report related to the unconsciousness of that individual and will send a signal to a conscious individual nearby capable of driving the vehicle. This again requires artificial intelligence to design the whole system. Now looking forward to human's social life, social relationships and compatibilities are major issues confronted by people. Some observations demonstrate that few people are not compatible enough to start any relations (casual, friendship or marriage) with other people. In our day to day life, we meet so many unknown personalities, some personalities are liked by us and we feel eager to talk and stay connected to them without any prompt reason, while on the other hand we find some people presence annoying and unbearable (sort of negativity). Therefore, these feelings are the basis on which we begin our relationships with someone. This is a natural phenomenon which occurs with every human being and the reason behind the occurrence of this phenomenon is the interactions of bio-fields of humans.

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Whenever biofield of humans interact with each other i.e. occurrence of biofield interference, automatically a new pattern is generated which effects every individual in a different manner. This pattern helps an individual to discover the compatibility of a person to start a relationship with [22]. Therefore, a system can be designed using biofield and artificial intelligence to check the compatibilities among individuals which will help individuals to build a healthy and compatible relationship. Envisioning the era of 2030, the era of bots and humanoids. Where humans can be replaced by humanoids to perform different tasks and to differentiate between humans and humanoids by unaided eyes is simply impossible. Now in 2030, the concept of biofield can be used to perform the differentiation task. As we know that the human biofield is generated in the form of electromagnetic waves which consists of different characteristic properties than machine generated electromagnetic waves. Thus, the biofield generated by humans and humanoids will be different from each other and easily differentiable [23] [24].

Human Computer Interaction (HCI) applications:

Human computer interaction is one of the subfield of artificial intelligence which deals with the interaction between humans and machines. It helps in generating the interface between machines and humans to perform certain tasks in a more convenient way. Presently, AI based systems are being used all over the world which results in their high demand. However, people find some difficulties interacting with these AI based systems, which delays their response time. Once the complete decoding and mapping of biofield is achieved, then this biofield can be used for direct communication between humans and artificial intelligence systems, which will bring a new mark of success in AI [24]. The nature of biofield is dynamic and changes with the thought process of an individual. Therefore, one must design expeditious AI bots which can read one's biofield directly and respond back rapidly.

Emotion dynamics:

Emotions obtained from bots and humanoids are referred to as "artificial emotions" while emotions from human beings are natural emotions. While experimenting with the bots and humanoids, it is difficult to analyze the difference between artificial emotions and natural emotions; which attracts Emotion Intelligence towards this area for research. In this research, humanoids are programmed to understand the emotions of humans by using audio and visual data analysis. Subsequently, these AI based bots learn these emotions, imitates them and respond back which indicates their level of understanding of these human emotions. Therefore, to differentiate between these natural emotions and artificial emotions, biofield and AI based systems must acquire the real-time data to analyze it. It is possible to classify natural and artificial emotions using the concepts of machine learning. Since biofield contains the psychological information of an individual which is the root cause of one's emotion, one can use biofield to understand and develop a system called "dynamic field emotion detector".

Other applications:

Envisioning the visualization and significant interpretation of human aura in the future furor and applications can be used in the area of "computer vision". Decoding the meaning of each color of human aura and providing the generated reports on it to the user. This report will provide

suggestions to the user on how to obtain a balanced life is another important application. Other than these applications, one can also measure and improve his/her performance at workplace [25] [26]. This will be possible by measuring stress level, environment study, lifestyle, anger management and other parameters which effects one's performance in doing any task. So, if an individual will be able to keep record of these parameters and start working for their improvement, then definitely this will help him/her to perform better. All of this is possible by using biofield information as a record and its daily analysis.

Plenty number of applications can be speculated in the field of healthcare informatics, sports management, education, medical analysis, self-development and improvement, astrology and many more [27] [28] [29] [30] [31]. This highlights the importance of study on biofield. With this one can open up huge research gateways and introduce revolutionary changes in the field of development. In the upcoming section, proposed framework is discussed, which may help in visualizing human biofield (another critical, yet important task).

II. PROPOSED FRAMEWORK

Brief ideas about the applications of biofield has been shared till now. However, biofield should be visualized i.e. biofield imaging and color interpretations of biofield image, before its applications in various fields, which is another challenging task. To overcome this challenging task deep understanding of biofield is necessary, which will require a team of various disciplines like biologist, neuro experts, physicists, technical person and others. Numerous devices has been designed to visualize and analyze human aura which are very expensive and not easily available in the market. In this proposed framework, an algorithm is designed which may help an individual to demonstrate the aura patterns around a person and to interpret the colors of biofield image. Figure 1, depicts the overview of working of the proposed system.

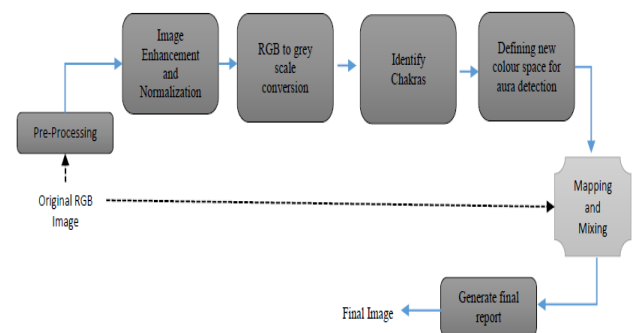


Figure 1

The basic idea behind this methodology is to generate the aura patterns around the human body using image-processing technique. Image processing is a sub-field of artificial intelligence. Below are the steps to be followed for implementation of the proposed algorithm:

1. Capture the image of the subject using digital camera.
2. Apply pre-processing technique to remove the noise, if any.



3. Allow the image to undergo image enhancement and normalization to increase the quality of the image.
4. Convert the image into gray scale image.
5. Apply machine learning techniques to identify the chakras in the image.
6. Define a new color space, which will visualize aura patterns around the subject.
7. Map this new color space, using learning method, with RGB color model to assign the color values.
8. Using liner regression, generate a predictive report, detailing the effects of color on the organs associated with each chakra.

Figure 2, shows the overall idea behind the working of complete model.

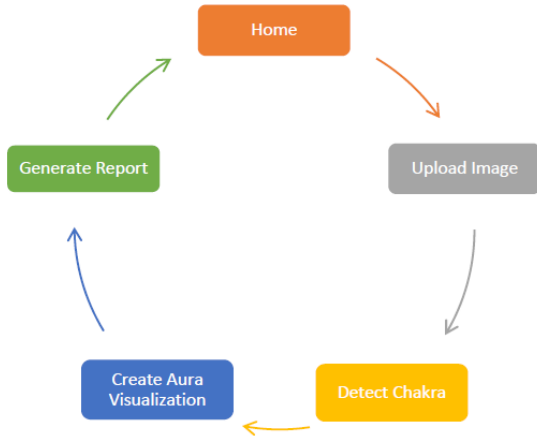


Figure 2

The basic ideology behind this research is to identify the psychological and physiological health using the biofield of an individual. Human biofield consists of various color patterns which are obtained by calculating the intensity of human energy emitted from one's body. The energy patterns are not visible to unaided eye as it lies beyond visible spectrum of electromagnetic spectrum of light, so, to make it visible, a cost-effective model is required which can be used for various applications, as discussed in previous sections. Prof. Korotkov's experiments shows that every individual form of thought varies from one another and this human biofield i.e. form of thought, can be further implemented in various medical applications. Such outcomes create new portals for various applications in different domains which makes it interesting concept and key feature of a human body. The information attained through the thought wave (biofield) may unlock various other mysteries and complexities of human life.

III. RESULT AND DISCUSSION

As discussed in the previous section, the proposed algorithm is implemented and experiment is conducted in a controlled environment. Figure 3 represents the overall result obtained from the experiment. The color patterns obtained are represented as Human Biofield or Biological field. This field consists of different information about the human.

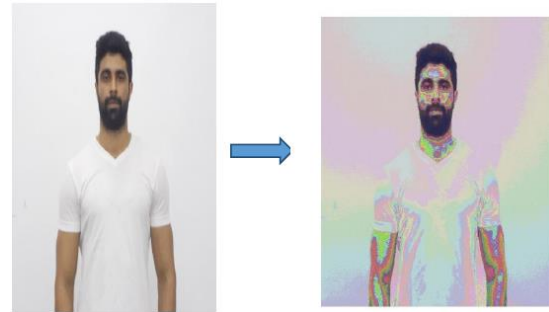


Figure 3 Outcome of the Proposed Algorithm

Whereas the figure 4, shown below, illustrates the interpretations made from the obtained results. It conclude that the generated report generated will support in medical examinations of an individual. In addition, after future enhancements in this research may help in providing more detailed and additional information that will enhance the medical investigations and wellbeing of an individual.



Interpretations:

As per the colour codes, RED colour indicates the area where problems are perceivable, due to the lack of energy in particular region. One can interpret that RED colour is spread all over the region of HEAD, CHEST, THROAT, ARMPITS and lower body parts. This states that person's organs in these regions may have some issues like infection, allergy and others. After the medical examination, it was clear that person is suffering from high fever and bad chest infections, further analysis states that he is having body ache due to same reason.

IV. CONCLUSION AND FUTURE

This research article shares the idea behind the diverse applications of human biofield in distinct domains. It includes different techniques which can be used for visualizing the invisible aura patterns and enlighten huge area of research and development in the field of medical applications and many others. This article also deals with the problem of identification of color pattern (major barrier) and includes the proposed methodology for the same. This may expose various hidden information related to human thoughts and medical conditions, which will further support in multifarious means that will be beyond imagination. Detection of colors radiated by invisible human physical body condition will bring new revolution in the world and its society. Human biofield represents the hidden dimension between health and life and its disturbance may result in human body dysfunctions and illnesses that cannot be cured by drugs or chemicals only. Further human biofield is rich in bio-information and one of the most complex dynamic field in the universe. Thus, it brings out new challenges to the technology for its understanding and decoding. Latest technologies like AI and its sub-fields, as tools, will help in deep understanding and unfolding the mysteries of the biofield. Applications of such technologies will help in developing peculiar projects, as discussed. These applications will further help in understanding the mind-body states, mental conditions, thought waves, automatic biofield measurements and suggestions for one's well-being.

In addition to that, biofield advancements may help in dynamic emotions understandings, lifestyle changes, new security measures (as biometric) and other interpretations. Along with all the opportunities and applications, it comes up with various challenges, which cannot be ignored. Hence, to overcome these challenges more research and intense study is required.

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