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THE MEANING OF SELECTED MIRACLES OF THE QUR'AN THROUGH THE EYES OF COMPUTER¹ ENGINEERING

Bekir Karlık²

Abstract

Currently, all scientific and technological developments and discoveries continue to confirm the miraculous verses of the Holy Qur'an. Indeed, the Qur'an, since time immemorial will continue until the Day of Judgment. Allah (S.W.T) has infinite knowledge that encompasses everything in the heavens and earth and what is in between them; in the worldly life and the Hereafter.³ As in all fields of technology, the latest developments in the field of computer engineering, the Holy Qur'an has shed light on different interpretations of some verses. This study presents explanations of some interpretation of the miracles contained in the Holy Qur'an through the eyes of computer engineering.

Keywords: Interpretation of Qur'an miracles, Computer engineering, Emotion, Biometrics.

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³ Al-Qur'an 2:255.

Introduction:

For fifteen centuries, the Qur'an has challenged Man to bring forth anything similar.⁴ Indeed, no one has brought a similar statement to the Qur'an, since the Qur'an has a sanctity of word that cannot be imitated by anyone. This is because the Qur'an is the Word of Allah (S.W.T). As it is known, the words become enveloped in literary arts. The essential meaning is an art. Arabic has an exceptional feature in the expression of the Qur'anic truths, especially from the words of the heart and the senses are very rich in it. We can understand the same Qur'anic truths to some extent by bringing forth examples relating to scientific developments and innovations in order to facilitate our understanding of the Book of the Universe. As has defined by B. Said Nursi, the Qur'an is the pre-eternal translator of the mighty Book of the Universe; the post-eternal interpreter of the various tongues reciting the verses of creation; the commentator of the Book of the Worlds of the Seen and the Unseen; the revealer of the treasures of the Divine Names hidden in the heavens and on the earth; the key to the truths concealed beneath the lines of events; the tongue of the Unseen World in the Manifest World.⁵

Notwithstanding the epochs of history, we may observe that the Holy Qur'an has become rejuvenated. In the modern era, the scientific and technological development affirms related miraculous declarations. The eternal Holy Qur'an is a sacred book that addresses all time and circumstance. Allah (S.W.T) knows best the past and the future, such that every miraculous declaration stems from eternal knowledge.

Allah (S.W.T) says in the Qur'an, "Nor anything fresh or dry, but is in a Record Clear".⁶ According to the one interpretation, the Clear Book or Record consists of the Qur'an. The above verse states that everything, whether new or old, is found within it: is this so? Indeed, everything is found in it, but everyone cannot see this, for all the things contained in it are discovered at different levels. Sometimes

⁴ Al-Qur'an 2:23-24; 10:38; 11:13.

⁵ Bediuzzaman Said Nursi, *The Words: On the Nature and Purpose of Man, Life, and All Things*, trans. Sukran Vahide (Istanbul: Sozler Publications, 2008), 376, <http://lh4h.org/wp-content/uploads/2013/05/The-Words.pdf>.

⁶ Al-Qur'an 17:88.

in the seeds and nuclei, sometimes in the summaries, principles, or signs - all are found either explicitly, or implicitly, or allusively, or vaguely, or as a reminder. These are expressed according to the need, in a manner suitable to the purposes of the Qur'an and in connection with the requirements of the position.⁷ If you ask why Qur'an does not mention chemical or physical formulas, such as H_2O or mc^2 , then there is no answer. The symbol of water in chemistry or the theory of general relativity are contained in books, which we read and comprehend. The Qur'an contains infinite data. Only Allah (S.W.T) who has infinite knowledge can analyze what is infinite. Current cloud or grid computing methods used by humans are helpless to analyze infinite data. Allah (S.W.T) refers only to matters which the human mind may find. Thus, it points to the water. It points to the sun. Everything is mentioned in the Qur'an according to its importance. The Qur'an also points out less significant things. The most important thing is Allah (S.W.T), accordingly, He is the most mentioned in the Qur'an. The second most important person is the human, who is the second most commonly mentioned entity in the Qur'an. However, the name of the Sun is mentioned a few times in the Qur'an, but there is no detail, so that humans are encouraged to develop knowledge from Allah (SWT). Therefore, these verses of the Qur'an point humans to apply their minds in order to develop new inventions by reading the Book of Universe.

There are many studies of various scientists according to the facts found in the Holy Qur'an, which conform to recent discoveries as scientific truths. For example, Alkassimi⁸ delineates the correlation between the most accepted scientific explanation of the origin and expansion of the Universe, and the description of its origin and expansion in the Qur'an. The miracle of embryonic development is mentioned in the Holy Qur'an, as affirmed by scientists concerning these scientific facts of the Holy Qur'an, which mentions the various stages of life after conception. In this verse, "Then We made from a *Nutfah* (small seed) an "*Alaqah*" (what is hung on to the wall of the

⁷ Al-Quran 6:59.

⁸ S. Alkassimi, "The *Qur'an* on the Expanding Universe and the Big Bang Theory," *The Religion of Islam*, last modified June 13, 2017, <https://www.islamreligion.com/articles/1560/quran-on-expanding-universe-and-big-bang-theory/>

womb from one point), then We made the “*Alaqah*” into a little lump of a chewy flesh, then We made bones out of that chewy flesh, then We clothed the bones with flesh and then We built (shaped) it with another creation. This is how blessed is Allah, the Best of the creators”.⁹ Professor Dr. Keith L. Moore says: “We have been astonished when we examine the embryo in this period what the words mean. Because the embryo came to an embellishment on the 28th day of life, and these looked like the same tooth marks as appearance. We made a plastic model of the embryo at this time, and we chewed it and left our teeth on it. The emerging landscape resembles the embryo we have studied at an extraordinary level which looks like a tooth marks very well as mentioned by Qur’an”.¹⁰ In addition, the Qur’an says that the baby’s development in the mother’s womb takes place in a three-stage formation and in three different dark regions.¹¹ Modern biology has reconfirmed this miracle of the Qur’an in the last century.

Today, astronomical findings have disclosed that iron found in our world has come from giant stars in outer space. But fourteen centuries ago, the Holy Qur’an implied that iron was something “sent down” from space not from this earth.¹² Moreover, the ordering of *Surah Al-Hadid* (The Iron) is chapter 57, which is the same as the mass of the iron isotope 57, comprising 31 neutrons and 26 protons, such that iron has the atomic number of 26.¹³ In the 68th and 69th verses of *Surah A-Nahl*, while explaining the work of honey bees, the verb used always refers to females. The Qur’an revealed the enigmatic meaning of these verses that the bees involved were nurse and queen bees, which was only discovered in the last few decades, through research from making honey.¹⁴

⁹ Al-Qur’an 23:14

¹⁰ Abdul-Majeed A. Zindani et. al. *Human Development as Described in the Qur’an and Sunnah: Correlation with Modern Embryology* (Makkah: Islamic Academy for Scientific Research, 1994).

¹¹ Al-Qur’an 39:6

¹² Al-Qur’an 57:25, and Mazhar U. Kazi, *130 Evident Miracles in the Qur’an* (New York, USA: Crescent Publishing House, 1998), 110-111.

¹³ Al-Qur’an 57:26; Edip Maşukiye, “An interesting Detection: Secrets of the Iron Store”, *Sızıntı* 73 (1985).

¹⁴ Al-Qur’an 16:68-69.

Recent advances of computer engineering are providing faster microprocessors and network communications, producing higher-density but more cost data storage devices. In turn, these advances lead to the new applications and interfaces such as transmission of odor, internal organs based on biometric, behavioral, and emotion recognition which are pointed out by the Qur'an more than 1400 years ago. This study aims for providing recent developments of the computer and software that could contribute to provide meditation (*tafakur*) for Muslims, and aims to encourage scientific researches to the Holy Qur'an through the eyes of computer engineering.

The remainder of this paper is organized as follows: the next section discusses the transmission of odor information. Section 3 analyzes the loss of the sense of smell in neurodegenerative diseases. A brief explanation on biometric and emotion recognition is given in Section 4. In Section 5, biometric and emotion recognition according to Holy Qur'an is presented in detail. Finally, some concluding remarks are provided in the last Section.

How Odor Information is Transmitted?

People have been searching for ways to communicate information over many years. This process, began with voice transmission, continued with image transfer with sound, mobile data, video and live broadcast transfer. Currently, scientists and researchers have been working on a live broadcast transfer of 3D images with sound. In the future, they will develop an odor transfer.

The smell spread in the air and the smell of the air particles will act as a heat and light. Each part of the air element or even thousands of individual particles, letters and words are included. Per molecule in the air, audio and video created the characteristics which make the smell transplant. Millions of sounds, smells and images of each other without interfering in the exit of each, will occur without disturbing the trillions of particles and transportation through the air. The reason for that is how the structure of our knowledge increases by new technological products. Therefore, the transmission of smell will be offered to the service of humanity in the near future. Odor perception occurs in our brain and chemical molecules from a lemon will

stimulate odor receptors, which are transmitted to the brain to be interpreted as an electrical signal. The human odor system can readily distinguish more than ten different types of smells. This creation has led scientists to design devices that are similar to the nose, such that these models are called electronic noses (or artificial noses).

The following verse of Holy Qur'an has been giving a clue to us about transmission of smelling information; "When the caravan left (Egypt) their father said: I do indeed scent the presence of Yusuf: Nay, think me not a dotard".¹⁵ The real meaning of the verses said  which means transmission. In this regard, some argue that scientists will also be able to transmit to odor as they have managed to transmit of the voice.¹⁶

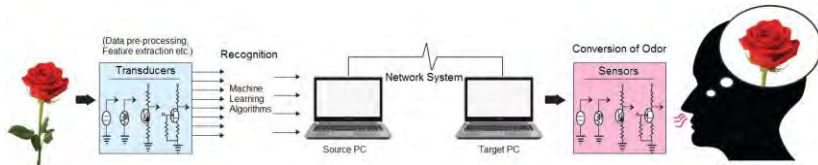
Electronic noses are systems that model of the human olfactory system. The receptors in this olfactory system are very complicated structure. There are two main components of electronic nose as the sensitivity system and the pattern recognition system. As observed in Figure 1, odor molecules carried on air particles is detected by the system in the vapor phase odor sensor and converted into the electrical signals. The sensor is one of the important factors for effectively and accurately odor measurement of electronic nose. There are various types of primary odor sensors that have been developed by the scientists for converting the signals of odor vapor to the electrical signals such as metal-oxide gas sensors, conducting polymer gas sensors, electrochemical gas sensors, acoustic wave gas sensors, quartz crystal microbalance sensors, field-effect gas sensors, surface acoustic wave sensors, and fiber-optic gas sensors.¹⁷

¹⁵ Al-Qur'an 10:94.

¹⁶ M. Hamdi, Yazır, *Hak Dini Ku'rân Dili* (Exegesis of the Holy Qur'an in Turkish) (1938); M. Toptaş, *Kur'an-ı Kerim Şîfa Tefsiri* (Exegesis of the Holy Qur'an in Turkish) (1993).

¹⁷ O. Ornek and B. Karlik, "An Overview of Metal Oxide Semiconducting Sensors in Electronic Nose Applications", (Proceeding, 3rd International Symposium on Sustainable Development, May 2, 2012), 506-515.

Figure 1: The stages of odor transmission



Electrical signals are digitized to extract their features with various signal processing methods. Then, one of supervised machine learning algorithms is used in recognizing the type of odor. Different types of machine learning algorithms can be used in the recognition and classification of different odors such as artificial neural network,¹⁸ learning vector quantization,¹⁹ fuzzy clustering neural networks,²⁰ CMAC Based Neural Networks,²¹ and Fuzzy C-Means Based Support Vector Machines Classifier.²²

Machine Learning is a paradigm of methodology that makes inferences from existing data using mathematical and statistical methods and estimates that are unknown with these inferences. The goal of Machine Learning is to make predictions for the future using the past data. Since it is not possible to manually process and analyze large amounts of data, data mining is defined as the purpose of examining data and extracting useful information from it. These two areas overlap in many directions. Data mining uses many machine learning methods, but mostly there are logically different objectives. Machine learning, on the other hand, uses data mining methods such

¹⁸ B. Karlik and Y. Bastaki, "Real Time Monitoring Odor Sensing System Using OMX-GR Sensor and Neural Network" *WSEAS Transactions on Electronics* 1, no. 2 (2004): 337-342; B. Karlik and S. Cemal, "Diagnosing Diabetes from Breath Odor Using Artificial Neural Networks," *Turkiye Klinikleri J Med Sci.* 32, no. 2 (2012): 331-336.

¹⁹ T. Temel and B. Karlik, "An Improved Odor Recognition System Using Learning Vector Quantization with a New Discriminant Analysis," *Neural Network World* 17, no. 4 (2007): 287-294.

²⁰ B. Karlik and K. Yuksek, "Fuzzy Clustering Neural Networks for Real Time Odor Recognition System," *Journal of Automated Methods and Management in Chemistry* (2007).

²¹ I. O. Bucak and B. Karlik, "Hazardous Odor Recognition by CMAC Based Neural Networks," *Sensors* 9, no. 9 (2009): 7308-7319.

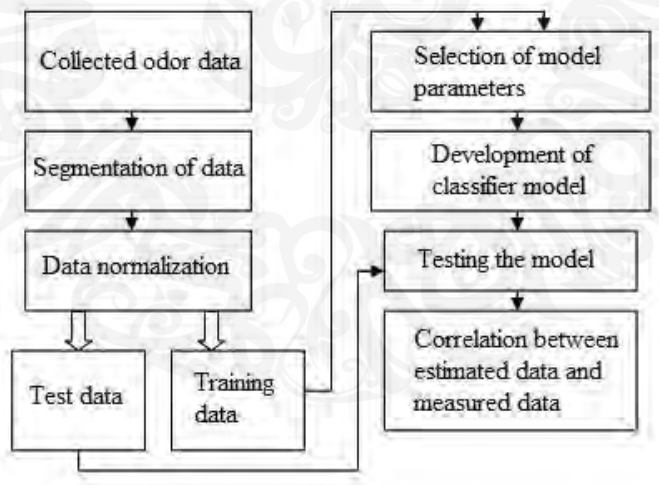
²² E. Esme and B. Karlik, "Fuzzy C-Means Based Support Vector Machines Classifier for Perfume Recognition", *Applied Soft Computing* 46 (2016): 452-458.

as uncontrolled learning or pre-processing to improve learners' accuracy.

Machine learning algorithms are categorized as supervised learning, unsupervised learning, semi-supervised learning, reinforcement learning, and inductive learning.²³ Some examples from our lives in machine learning are as biometric recognition, document classification, spam and intrusion detection, intelligent control systems and robotics, biomedical pattern recognition, business intelligence, and natural language processing. Different applications have different expectations than analyzes. It is therefore possible to classify machine learning methods according to these expectations.

Figure 2 presents a flowchart of work principles for the machine learning algorithm in terms of classification or recognition. As seen in this flowchart, collected data by odor sensor is segmented, is scaled, then it is normalized. The same processes are performed for both test and training data. Then one of suitable classifier model is selected regarding model parameters. Finally, the results of output are tested.

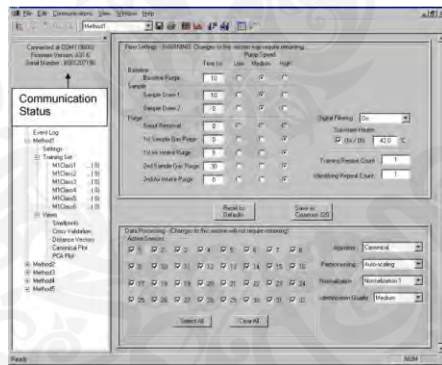
Figure 2: Flowchart of working principle of the classification algorithm



²³ B. Karlik, "Machine Learning Algorithms for Characterization of EMG Signals", *International Journal of Information and Electronics Engineering* 4, no. 3 (2014): 189-194.

Figure 3 shows an e-nose opening screen with the main menu icons expanded. This information network with a transmission line such as internet or mobile communication is transmitted to a remote environment. Odor type is displayed on the target computer.²⁴ The time recognition of odor is limited only by the response of the used sensors, but the recognition process can be within milliseconds. The odor transmitting system enables users to connect remotely to another computer and transfer data virtually. The current technology only allows the transmission of smell knowledge. In order for the conveyed information to be perceived as an odor at the target point, it is necessary for the smell to be stored in the special pots in this environment and to be stimulated by the smell of the incoming smell. It is also necessary to develop secondary sensors which convert physical electrical signals to chemical odor signals for odor transmitting. Research in this area is limited to unfinished pilot studies. Primary sensors are already available that convert the olfactory signal to electrical activity.

Figure 3: Opening screen of an e-nose with the main menu icons

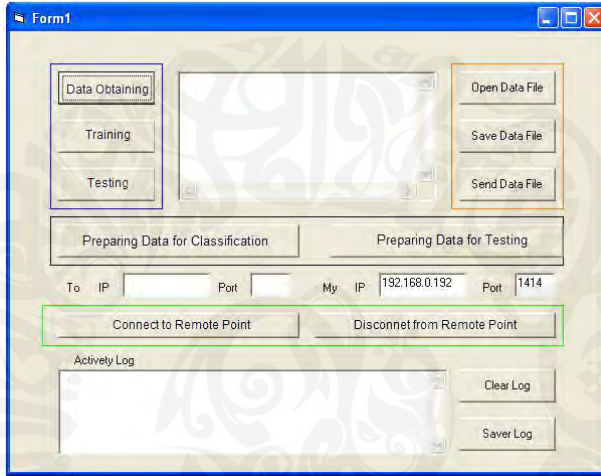


As observed in Figure 4, users are able to interact with the system through several buttons and so they are able to open a data file, obtain data, save the file, prepare the file to be classified, prepare the file for testing, connect to the remote point, and disconnect from remote point. This Real-time monitoring odor sensing and tele-smell

²⁴ B. Karlik, "Odor Transmission," (in Turkish), *Sızıntı* 36, no. 426 (2014): 23 – 25.

system has been developed by Karlik and Al-Bastaki.²⁵ It is composed of an odor identification system transmission channel, and an odor regeneration system. The goal of this proposed model is to show the concept of Tele-smell and olfactory input in a virtual reality environment, which is also adaptable for Wi-Fi connection.

Figure 4: Opening screen of an e-nose with the main menu icons²⁶



The odor recorder for recording the dynamical change of odor has been studied by scientists, since the odor in atmosphere is always changing. Systems that mimic more of the functionality of the human olfactory system require a much larger set of sensing elements. Unfortunately, the secondary sensor is converted electrical signals to odor vapor, has not been developed yet, so current technology allows only for the transmission of odor information. It is perceived as smell transplanted knowledge of the destination, or the smell of the media present in the state stored in containers, and the smell information via warned media release must either be converted into a signal odor that directs the odor information by using a secondary sensor, which will

²⁵ Karlik Bekir and Bastaki Yousif, "Transmission of Olfactory Information," *College of Information Technology, University of Bahrain, Technical Report* (2004).

²⁶ Karlik Bekir and Bastaki Yousif, "Real Time Monitoring Odor Sensing System Using OMX-GR Sensor and Neural Network," *WSEAS Transactions on Electronics* 1, no. 2 (2004): 337-342.

be developed in the future. In this case, while watching a cooking program on TV, it will be possible to smell the odor of food waves, which can be spread to our room, after pressing a button on the remote control; or perhaps, the smell of the ocean, which takes us onto a ship's deck, we would be possible to watch the screen as if we were there.

The smell spreads in the air when the fragrance particles move in the air, like heat and light. With each molecule in the air, sound, image and odor are transferred. Millions of sounds, smells, and images go in and out of each of the trillions of air bubbles without interfering, without distortion. As long as we know more about what is occurring, new technological products can be developed to transport the smells for the service of humanity.

The same is true for the air, which is a place of maximum manifestation of the Divine will and command; either there would have to be present on a minute scale in each of its molecules, in each waft of wind, each breath the innumerable different exchanges, centers, receivers and transmitters in the world so that each could perform those innumerable acts at the same time. In order that all the telephones, telegraphs, radios, unlimited and various speeches of the world can be found in every part of the air, which is the "air" of the attributes of God's command and will, and we assume are all found in the particles, such that all of these wonderful things operate according to the Divine power and will of Allah (S.W.T).

Is it Point out Loss of Sense of Smell in Neurodegenerative Diseases?

Parameters such as sweat, blood, urine and gaita produced by the human body can be used for diagnosis of diseases. In recent years, the odor has begun to be used as an important data for diagnosis. The smell of gases in the human breath carries important information about body health. There are two hundred to four hundred different gases in the human nose. In addition, the type of gas that is perceived and described in the breed passes through three pieces. While the blood is being cleared in the lungs, the contaminated gases in the lungs pass through the alveoli. Therefore, many parameters related to the body are found in the breath. Gases exhaled through the breath consist of various alkaline and aromatic components. Each of these is

a potential marker of information about the disease. The gasses and the proportions of a healthy person's breath are determined.²⁷ Because of the different rates of gas in the breed due to the disease, the diagnosis of diabetes (type 1 and 2 types of diabetes), cancer, ENT, tuberculosis, upper and lower respiratory tract and gynecological diseases can be done by using electronic nose.²⁸

Verse 94 of the *Surah Yusuf* (Joseph) points to the meaning of another miracle. In this verse, Prophet Jacob says that, "Surely, I perceive Joseph's scent (the breeze coming from Joseph) if you do not say that I am a dotard".²⁹ Here dementia is pointing to diseases. Colloquially "dementia" called the first sign of Alzheimer's disease is a loss of smell. Alzheimer's is one of brain diseases which give rise to a slow decline in memory, thinking and reasoning skills. Alzheimer's disease is known to disrupt the electrical pathways and neurotransmitter activity between brain cells. In recent years, by looking for loss of sense of smell in neurodegenerative diseases such as Alzheimer's disease can be approximately 10 years ago. Researchers have declared that when somebody starts losing their sense of smell, it can be caused one of the first signs of Parkinson's or Alzheimer's disease.³⁰ They have investigated the linked smell loss in mice with extreme levels of a key protein associated with Alzheimer's disease. Their results suggest that individuals who are genetically at risk for developing Alzheimer's disease may perform more poorly on memory and smell measures compared to those not at risk. So, if smell function declines as the levels of this protein increase in brain regions incorporated with smelling, the research could validate the use of smell tests for early diagnosis of Alzheimer's disease.

²⁷ B. Karlik and Y. Basaki, "Bad Breathe Diagnosis System Using OMX-GR Sensor and Neural Network for Telemedicine," *Clin. Informat and Telemed.* 2 (2004): 237-239.

²⁸ B. Karlik and S. Cemal, "Diagnosing Diabetes from Breath Odor Using Artificial Neural Networks," *Turkiye Klinikleri J Med Sci.* 32, no. 2 (2012): 331-336.

²⁹ *Qur'an* 10:94.

³⁰ S. S. Schiffman et al, "Taste, Smell and Neuropsychological Performance of Individuals at Familial Risk for Alzheimer's disease," *Neurobiology of Aging* 23, no. 3 (2002): 397-404; R. I. Meshulam et al, "Olfaction in Neurodegenerative Disease: A Meta-analysis of Olfactory Functioning in Alzheimer's and Parkinson's Diseases," *Arch Neurol.* 55, no. 1 (1998): 84-90.

What are Biometric and Emotion Recognition?

Biometric recognition describes as every person that person's physical or behavioral characteristics and the identification of data showing the comparison technique. We can provide examples of characteristics showing such properties concerning the iris, retina, the palm print and fingerprint recognition, which differ for each person and that person is special and these characteristics are inimitable.

Recently there have been many scientific studies conducted on both face recognition³¹ and speech recognition.³² Face Recognition can be described as classifying a face either "Known" / "Genuine" or "Unknown" / "Imposter", after comparing it with known individuals stored in a face database. In classical face recognition processes, images are transformed into numerical values by using different transformation methods such as Principle Component Analysis (PCA), Principle Differential Analysis (PDA), Wavelet Transform (WT), and Discrete Fourier Transform (DFT). In these cases, it is difficult to recognize when people change their faces due to surgery, accident, and aesthetics etc. In such cases, Tilki and Karlik have developed a process of recognizing faces using the proportions of the organs of the face and the golden rates of these dimensions.³³

Speech is a sound which is produced by the human speech production mechanism. It involves processing human speech as both a signal and a form of the language. Speech is produced by the vibration at the vocal cords due to the air passing out (or into) the lungs. The pitch of vibration can be modified by muscles and varies from person to person depending on their anatomies. Everyone's anatomical structure has a unique, so, everyone's sound is different. For example,

³¹ V. Atamuradov, A. Eleyan, and B. Karlik, "Performance Evaluation for Face Recognition Using Wavelet-based Image De-noising," *TAECE2013* (2013): 284–287; A. Otkun and B. Karlik, "Facial Recognition System by Using ANN and Window Average," (presentation, TOK 2013, September 26-28, 2013, Malatya).

³² H. Altun and G. Polat, "Boosting Selection of Speech Related Features to Improve Performance of Multi-Class SVMs in Emotion Detection," *Expert Systems with Applications* 36, no. 4 (2009): 8197 – 8203.

³³ B. Tilki and B. Karlik, "Face Recognition by Using Face Dimensions and Artificial Neural Networks," (proceeding, the 4th International Conferences on Information Security and Cryptology (ISC '10), May 6-8, 2010, Ankara, Turkey), 355-359.

female speakers are characterized by high pitch value compared to the male speakers. Airflow is modified by articulators (the tongue, lips, lower jaw etc.) to produce a desired speech output. Speech Recognition is used for not only Biometrics but also Communication, and Man-Machine Interaction.

Biometric and Emotion Recognition According to Holy Qur'an

In the Qur'an, "And if We had willed, We would have shown them to you. Then you would have certainly recognized them by their faces. And most certainly you recognize them by the connotation of their speech, and Allah knows your deeds".³⁴ This verse points out biometric recognition (face and speech recognition). The open enemies of Islam openly express their feelings, and the hidden enemies, the hypocrites, were trying to hide their situation. Allah revealed their hatred and enmity in their hearts on many occasions, and over time many of them were unmasked. The list of those who control their behavior and conceal their emotions is not given, and hundreds of them are not put in order to be easily recognized by everyone. But Prophet Muhammad (S.A.W) and a few his companions, with the help of Allah, they understood and recognized them both from their similes and their speaking styles. We may consider this verse with the previous verse (29), which discusses behavior and emotion recognition; "Or did those in whose hearts is a disease think that Allah will not bring forth their (hidden) grudge?"³⁵

The rapid increase in technological developments also increases people's quality of life. People of today prefer intelligent systems that automatically detect and apply the processes they want to do. Emotion recognition can be explained as facial, vocal, auditory, musical and dynamic stimuli, as well as subconscious measures such as skin conductance or heart rate. With emotional expression analysis, people's mood can be analyzed and this analysis process can be adapted to the emotionally sensitive control systems.

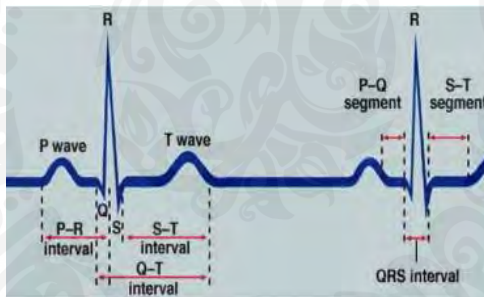
In recent years, many studies have been conducted on the recognition of the emotional expressions in the face such as extended

³⁴ Al-Qur'an 47: 30.

³⁵ Al-Qur'an 47: 29.

software usability testing, education and e-education, enhanced websites customization, and gaming.³⁶ In addition, some dementia syndromes such as Alzheimer's disease, front temporal dementia, Huntington's disease, and progressive supranuclear palsy can be diagnosis by using emotion recognition methods.³⁷ More recently, electrocardiogram (ECG) measures the electrical activity of the heart, is used not only for diagnosis of arrhythmia³⁸ but also used for person identification³⁹, and emotion recognition.⁴⁰ Electrocardiogram (ECG) is the specific type of biomedical electrical signals resulting from the heart activities which can be perceived from the human body. As seen in Fig. 5, ECG signals mainly consist of P wave, QRS complex and T wave. Here, P wave indicates the duration of Atrial depolarization. The repolarization is incorporated into the QRS. The time from the beginning of the P wave to the beginning of the QRS is expressed as the P-Q segment and indicates the duration of delivery of the stimulus to the ventricles.

Figure 5: The waves of an ECG



³⁶ A. Kolakowska et al., "Emotion Recognition and Its Applications," *Advances in Intelligent Systems and Computing* 300 (2014): 51-62.

³⁷ F. Kumfor and O. Piguet, "Emotion Recognition in the Dementias: Brain Correlates and Patient Implications," *Neurodegen. Dis. Manage.* 3, no. 3 (2013): 277-288.

³⁸ R. Ceylan, Y. Ozbay and B. Karlik, "A Novel Approach for Classification of ECG Arrhythmias: Type-2 Fuzzy Clustering Neural Network," *Expert Systems with Applications* 36, issue 3, part 2 (2009): 6721 – 6726.

³⁹ E. Rabhi and Z. Lachiri, "Biometric Personal Identification System Using the ECG Signal," *Computing in Cardiology Conference (CinC)* 40 (2013): 507-510.

⁴⁰ F. Agraftioti, D. Hatzinakos, and A.K. Anderson, "ECG Pattern Analysis for Emotion Detection," *IEEE Trans. on Affective Computing* 3, no. 1 (2012): 102 – 115.

The QRS complex gives the sum of the periods of ventricular depolarization and atrial repolarization. The basic parameters are important in a normal phase of a heartbeat. The shape and duration of the waves, the interrelationship of the P wave, the QRS complex and the T wave, and the R-R intervals should be examined in detail. The deficiencies and changes in the parameters examined may depend on any cause and may indicate an arrhythmia in the heart, and thus a disease.⁴¹ All irregular phases of heart beats are termed arrhythmia and it also means that the heart rhythm is distorted. So, ECG signals are of great importance in the evaluation of cardiac diseases during continuous monitoring and evaluation of possible abnormalities and complications. Currently, computer assisted arrhythmia classification plays an important role in the diagnosis of cardiac disorders.⁴²

ECG shows a biometric characteristic which means that by defaults it carries particular information. The aspect of a specific heart beat is based on different factors like orientation and shape of a cardiac muscle, the activation order, the conductivity of different region of the heart, gender, etc. ECG signal and presents a thorough analysis of its psychological features such as fear, disgust, excitement etc. Moreover, different persons experience emotions in various ways. However, the nerve-endings of the autonomic nervous system inside of a cardiac muscle play an important role in the cardiac output that affects the rhythm at which the muscle pumps blood.

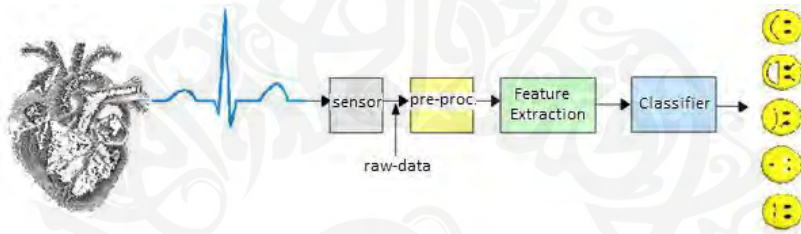
Figure 3 shows a block diagram of a sense of recognition from the ECG signal. As with the general structure, it is similar to the biometric recognition system. The emotion information according to different psychological feelings has been obtained from ECG signal

⁴¹ H. Yanardag, *Clinical Electrocardiography* (Cerrahpaşa Medical Bookstore, 1991).

⁴² R. Ceylan, Y. Ozbay, B. Karlik, "A Novel Approach for Classification . . . ; B. Karlik, et al., "Bundle Branch Blocs Diagnosis Using Neural Networks for Telecardiology," *Ukrainian J. of Telemedicine & Medical Telematics* 4, no. 1 (2006): 37-41; Y. Ozbay, R. Pektatli and B. Karlik, "A Fuzzy Clustering Neural Network Architecture for Classification of ECG Arrhythmias," *Computers in Biology and Medicine* 36 (2006): 376-388; R. Ceylan, Y. Ozbay, and B. Karlik, "Comparison of Type-2 Fuzzy Clustering Based Cascade Classifier Models for ECG Arrhythmias," *Biomedical Engineering: Applications, Basis and Communications (BME)* 26, no. 6 (2014): 1450075.

which is received by using surface electrodes from P and T waves, QRS Complex and RR interval varies. This recorded and sampled signal is preprocessed to detect RR interval of ECG signals⁴³⁻⁴⁴. Then, ECG signal is filtered by using both low pass and high pass filters respectively.⁴⁵ QRS detection is found from filtered ECG signal. Then a suitable supervised machine learning algorithm is used as classifier for recognition of different types of emotions.⁴⁶

Figure 3: Block diagram of emotion recognition



For Allah (S.W.T) the heart is the principal organ of the relationship and communication. Allah (S.W.T) constantly looks at people's hearts to know everything therein⁴⁷ and questions them.⁴⁸ So Allah (S.W.T) intervenes in a persons' heart,⁴⁹ thereby turning the heart and leading him in a certain direction, therefore, Allah (S.W.T) is fully aware of what is in our hearts.⁵⁰ Previously, scholars divided the physical and spiritual heart such that the heart organized the physical body, the spiritual heart is alleged to regulate our personality. The physical and spiritual heart as a whole needs to be addressed. Indeed, a

⁴³ Y Özbay, R Ceylan, and B Karlik, "Integration of Type-2 Fuzzy Clustering and Wavelet Transform in a Neural Network Based ECG Classifier," *Expert Systems with Applications* 38, no. 1 (2011): 1004-1010.

⁴⁴ R Ceylan, et al, "Telecardiology and Teletreatment System Design for Heart Failures Using Type-2 Fuzzy Clustering Neural Networks," *Inter. Journal of Artificial Intelligence and Expert Systems* 1, no. 4 (2011): 100-110.

⁴⁵ S. Canan, Y. Ozbay, and B. Karlik, "A Method for Removing Low Varying Frequency Trend from ECG Signal," *Biomedical Engineering Days* (1998): 144-146.

⁴⁶ B. Karlik, "Kur'an-ı Kerim Işığında Biyometrik ve Duygu Tanıma," *Sızıntı* (2015).

⁴⁷ Al-Qur'an 3:154.

⁴⁸ Al-Qur'an 2:74.

⁴⁹ Al-Qur'an 8:24.

⁵⁰ Al-Qur'an 8:70.

variety of feelings and emotions, beliefs, perceptual is the intention and the will-dependent activities, moral attitudes, pity, fear, anger, etc. all psychological behavior is directly linked to the heart. In short, the heart is sensitive to people's emotions sensitive.

Conclusion

The Holy Qur'an came from time immemorial and will continue for eternity. Science flows from the Qur'an and science affirms the Qur'an as a miracle. Indeed, the Qur'an was revealed 14 centuries ago, but everything will be judged from one point to the next, like individual beads on a necklace all of which Allah (S.W.T) knows, even the beat of our hearts has become part of eternal knowledge.⁵¹ The Holy Qur'an offers us clear statements and evidences, in order to teach us through signs and indications, in the stories of the prophets and their miracles that encourages mankind to attain similar achievements.

Indeed, investigative scholars and the science of rhetoric agree that all the Qur'an's verses contain numerous aspects of guidance and instruction. The verses of the miracles of the Prophets, which are not mere historical stories, but comprise numerous meanings and guidance. These miracles trace the final limit of man's science and industry, pointing at his furthest aims and specifying his final goal. Man is encouraged to strive forward, with lessons from the past, which acts as a store of seeds for the future and mirror its attributes, so the future is the arable field of the past and the mirror to its state.⁵²

As time progresses, the Qur'an is rejuvenated.⁵³ New scientific developments that affirm the signs are becoming apparent. This, in turn facilitates our understanding of the Qur'an as scholars increasingly discover knowledge of truths through research.

In terms of *tafsir*, it is not easy to provide commentary on all the verses of the Qur'an through eyes of a theologian. In order to understand meaning of miracles contained in some verses, in this context, it is necessary to refer also to the views of different scholars

⁵¹ Al-Qur'an 50:16.

⁵² B.S. Nursi, *The Words* . . . , 260-275.

⁵³ B.S. Nursi, *The Letters: Epistles on Islamic Thought, Belief, and Life* (Somerset, N. J: Light, 2007), 498.

such as physicians, engineers, astronomers, etc. who have faith. Developments in the fields of science and technology in the world reveal new research and approaches. The discovery of the results of a research and approach is no longer a single field of thinking and evaluation, but also of other disciplines that will support these ideas and assessments. In reality, we have to be more careful with respect to new *tafsir* studies. In this regard, Allah (S.W.T) says in the Qur'an; "(O Muhammad), whenever we raised any Messengers before you, they were no other than human beings; (except that) to them We sent revelation. So, ask those who possess knowledge if you do not know".⁵⁴

This paper has presented explanations of some miracles meaning of the Holy Qur'an through the eyes of a computer scientist. The Qur'an is unique and miraculous book, which is to correctly tell unknown names of God to us, to inform us of the universe's undiscovered laws, and to tell us the true geography of the unseen. So according to new scientific researches by computer science and the other sciences and technologies, we will learn more information about the undiscovered and unknown things of life from the Qur'an in the future.

For example, at the, beginning of 29 *Surahs* (chapters) of the Qur'an, there are 29 disjointed letters (*Muqatta'at*), which are unique letter combinations such as *alif, lam, mim, ta, ha, ya, sin* etc. *Tafsir* scholars are not able to explain the mystery of these disjointed letters. This mystery can be defined by using new techniques of coding theorems or cryptology systems. In addition, the secret of the throne of Belkis, one of the miracles mentioned in the Qur'an,⁵⁵ can be solved by new developments in three-dimensional image processing. Similarly, one of the other miracles mentioned in the Qur'an is how Prophet Solomon talked with birds.⁵⁶ This mystery can be understood with novel innovations of natural language processing, and speech recognition.

⁵⁴ Al-Qur'an 16:43.

⁵⁵ Al-Qur'an 27:39-40.

⁵⁶ Al-Qur'an 27:20-28.

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