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Utilizing Fuzzy Algorithm for Understanding Emotional Intelligence on Individual Feedback

Elham Abdulwahab Anaam[1*], Su-Cheng Haw[2], Kok-Why Ng[3], Palanichamy Naveen[4], Rasha Thabit[5]

[1,2,3,4] Faculty of Computing and Informatics, Multimedia University, Jalan Multimedia, 63100, Cyberjaya, Malaysia.
[5] Department of Computer Techniques Engineering, Dijlah University College, 00964 Baghdad, Iraq.
**corresponding author: (anaamelham@gmail.com, ORCiD: 0000-0002-1497-5509)*

Abstract - Although previous studies looked at how employees should seek assistance, the issue is the research investigation into how behavioral intelligence affects employee satisfaction is limited. This study examines several significant usages and developments of fuzzy mental modelling. The primary objective of the current section is to provide an innovative technique for modelling an emotion-based acceleration of the compressor for individuals. Methodologies of experiential thinking postulate that our comprehension of facial emotional reactions depends significantly on facial behavior imitation and the reactions as opportunities. Considering the theoretical foundations of combined logical reasoning. In addition, the hypothesis of probability, it additionally is not effective to build a comprehensive hypothesis concerning impressions. Combining emotional intelligence with fuzzy logic as a combination, we were able to tackle issues with current techniques that neither artificial intelligence nor fuzzy mathematics alone could.

Keywords—emotional intelligent, fuzzy algorithm, individual feedback, fuzzy cognitive map, fuzzy logic

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I. INTRODUCTION

An individual may have mastered interpreting another person's emotions from their outward expressions. For instance, it has become common knowledge that a person's bodily changes may reveal a lot about them and how they feel emotionally. In his body expressions, a human exhibits significant perception-based behavior. Individual variations are not sufficiently taken into account [1] to reveal a person's true feelings when certain conditions are met. Due to the fact that the brain of the person has a limited ability to distinguish the specifics of progressing, perceptions are by their nature erroneous. The current main goal is to present a new method for simulating emotion-based motion so that people may demonstrate how to express their feelings through motion [2],[3].

One such topic is expression imitating, in which a suitable emotion is presented in accordance with a combination of several qualitative and quantitative criteria. Because they rely on bivalent, present procedures, in this perspective, have a severe flaw because they limited provide solutions for dealing with data that depends on comprehension [4]. The objective is to present a new method for modelling an individual's emotion-based compressor acceleration. This approach makes use of Computerized Technology of Perspectives (CTP), which has the ability to estimate and correlate reasoning using data based on perception, and it examines behaviorally the movements of various expression

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kinds and the imitation of sentiments in diverse circumstances. In this paper, a fuzzy logic-based analyzer that transforms human communication phrases into the General Constraint Language (GCL) is introduced. Fuzzy logic-based probabilistic notions, as opposed to hybrid logic-based estimate theory, can operate on perception-based data. Our fuzzy analyzer extracts two types of communication propositions from a single phrase:

1) a category of sentimentality, such as joy, rage, goodwill, pressure, misunderstanding, and melancholy.
2) The degree (greater, fewer) of that expression. When dealing with everyday problems like creatures of humanity communications, where decision-relevant data represents a combination of data collection and assumptions, the mathematical understanding of impressions improves Artificial Intelligence's (AI) capacity to do so. An intelligent human's movements are a balance among quantitative data for tracking patterns in creatures of humanity connections and sensible interpretations of experiences.

A variety of methods, centered on Computational with Words and Perspectives, CTP, and Precipitated Natural Language Processing, are needed to cope with perception-based evaluation of the motion of objects [5]. Figure 1 depicts the overall architecture of the proposed fuzzy analyzer.

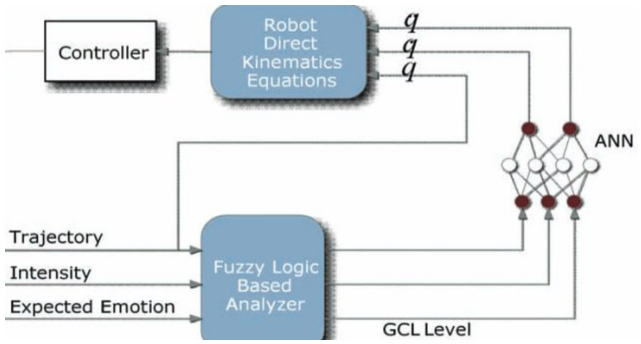

Figure 1. Overall Structure Of Emotions Intelligent [5]

In addition, this paper presents a trend in Fuzzy Cognitive Map (FCM) research as well as an overview of previous years' implementations of FCMs. There is also discussion of the theoretical approaches and FCM variations proposed by various researchers to better utilise them in numerous applications. Providing all of the best practices from every sector is difficult because there have been a lot more FCM papers published in the past several years. It is challenging to provide all the exemplary implementations throughout all fields because during the previous years, the accumulation of FCM articles has significantly expanded. As a result, we make an effort to choose just a few of the most emblematic works produced throughout the decade that followed in the several aforementioned key categories.

II. LITERATURE REVIEW

A. Emotional Intelligence in Interactions Between Peoples

Early in the 1990s, Mayer put out the idea of emotional intelligence (EI), arguing that understanding sentiments and emotions might boost intellect [1]. Subsequently, some researchers developed further theories of emotional intelligence to clarify how people process sentimental information about both themselves and others. The few widely used models take into account abilities [4], characteristics [6], and a combination of the two [4]. Following that, behavioral scientists developed many EI models to describe how people process sensitive information about themselves and others. The few models that are most often used consider capacities [5],[8], traits [7], and a mix of both [5]. The characteristics model [8] emphasizes an individual's capacity to assess their own inborn qualities, including flexibility, self-worth, and capacity for social interaction.

Since its establishment as an alternative understanding metric in 1999, the approach describes EI as a variety of capacities for processing and utilizing impacting data, that are able to be ranked in a consensus-based manner or assessed concerning authority ratings [9],[10]. It is challenging to have virtual assistants evaluate a essential features

for this research. VAs are imitating the effects of experiencing emotional rather than being an expression of the deep emotions of individuals[11]. It therefore makes simpler to understand perceive to gauge a emotional intelligence by their capacity to communicate EI to people based on (i) the capacity to recognize and interpret sentiments through words used in conversation, body language, facial expressions, and artifacts of culture is known as processing emotionally, and (ii) the capacity to take advantage of emotional which most effectively support cognitive procedures is known as employing emotional [4]. They recognized that a moderately depressed mood encourages meticulous, methodical operation while a high mood encourages creative and imaginative consideration. For instance, consider the difficult jobs that people with high emotional intelligence must do given the current state of consideration variations [6].

Individuals with emotional intelligence may effectively capitalize on their current state of mind fluctuations when faced with academically challenging activities because they understand that, for example, a moderately depressed mood encourages meticulous, methodical operation while a high mood encourages creative, imaginative considering [6]. Understanding emotion is the ability to spot emotional cues while describing how feelings evolve through time [1]. It emphasises responsiveness to minor distinctions in sensations, such as the subtle variances among happiness, including the intricacies of sentiments, such as how disappointment can turn into depression [12]. Emotional management is the ability to manage one's own and other people's emotions. For instance, a leader with intellectual acumen may use a forceful, furious speech to incite the population's rightful rage [2], [3], or [10].

B. Related works

There are essentially only two parts to the skill of emotional intelligence. One of these is feelings, that is described as "organized behaviors that traverse the limits of several cognitive components, which include the emotional, intellectual, encouraging, and experiencing processes. In consequence of a circumstance that is either inwardly or independently induced, moods typically arise[13]. By controlling and comprehending the moods of their employees, experienced administrators and managers may accomplish company objectives. Emotions convey understanding, data, and signals in individuals. Therefore, an effective leadership team that considers the feelings of their staff members will obtain these unrestricted resources[14].

Artificial Intelligence, that is described as "the comprehensive ability of an individual to act meaningfully and to understand rationally," is an important aspect of social and emotional intelligence. A limited number of studies have examined the impact of human facial observations modulation on the electrophysiological understanding of psychological expressions up to this point [15]. When asked to assess the strength of signs of emotion, individuals had to either adopt a pleased expressions of emotion by scratching on a pen or remain a face that was apathetic by releasing the muscles underneath their faces. [16] made an effort to interfere with the inherent input received from the lower area of the human face and looked into the impact on later cognitive interpretation of the movements of the face. The results showed the aforementioned impairment developed (these needs is an illustration for the availability to semantically related data related to remembering) to content and dissatisfied is facing. Satisfactions from customers are categorized as favorable or bad using emotion predictions. A comprehensive scheme of emotion identification takes into consideration each feeling, such as "stressed or "happy" [13].

Conventional methods for multidimensional emotion integration have no opportunity to handle the variety of data formats, including text, audio, and video. Additionally, it's becoming challenging to effectively adjust settings for several procedures [17]. The vast quantity of difficult-to-visualize attributes in their system is one of its limitations. The complicated emotions can instead be depicted by fuzzy mixing of incomplete sub-emotions, and we demonstrate how we can combine combined written material and audio recordings elements into a 4 multidimensional approach Affective- matrix. In [15], the authors use lexical variables which include word matrices and components of language to weigh in on fluent in multiple languages emotion analysis. Their approach, however, is not capable to simulate sentiments in communications. To identify the tone of certain words in reviews of restaurants, a different author employed fundamentally data storage connections [16]. To record the placement of words, they take into account a further "concentrating" nodes in every layer of data. Because of the combinatorial level of complexity in this approach, convolutional algorithms attributes are used to capture the historical setting of linguistics in respect to their surroundings [17].

C. Individual Behavior

The development of CMs as an approach for addressing political, social, and strategically important problem modeling and decision-support in the face of impending catastrophe. In an effort to address the essential drawbacks associated with the emotions, including the need to recalculate the weights connected to the theory every single time an alternative approach is implemented, the study's authors of Andreou et al. recommended the utilization of the inherited developed confidence neuronal tissue fuzzy psychological connect [18]. When the criteria are established, this new technology paired with have the advantages of being able to provide the best answer needing the use of the process of problem-solving. Using a study that includes several scenarios, an illustration that depicts the combination technique's effectiveness was used to show its effectiveness.

D. The Effects of Emotional Intelligence on Work Outcomes in the Workplace

Organizational settings necessitate face-to-face communication. The majority of all of these encounters have to do amongst performing work-related responsibilities, including providing clients, taking directions, focusing to high-ranking officials or collaborating and coordinating with coworkers [19]. Individuals who possess a significant amount of the skill of emotional intelligence are individuals who are highly adept at interacting with people and are capable of using regularization according to past experience and feelings and emotions. Relationships with other people requires emotions engagement with other individuals, and expressing happy feelings has been connected to a higher chance of achieving achievement within the workplace, demonstrating the clear relationship between behavioral intelligence and effectiveness. Emotional competence is thought to be related to other positive results like dedication to the organization and occupational fulfilment[8]. The correlation between emotional intelligence and occupation effectiveness is influenced by the percentage of psychological effort needed by the position of responsibility, and the connection among sentimental intelligence and individual fulfilment is controlled by the duration of emotional work involved. Emotional skills is significantly connected to occupational effectiveness, significantly relating to academic feeling satisfied, and successfully relating to dedication at work[20]. The purpose of our study was to examine the relationship between behavioural intelligence and accomplishments in the workplace or work-related happiness in leaders as well as employees by examining the interrelated correlation matrices.

E. Emotional Exhaustion Emotional

One fundamental component of emotional stress is psychological weariness. Consequently, feelings tiredness is an issue brought on by sustained workplace stress, and it affects workers, particularly those in the human services industry. Additionally, developing little motivation is a symptom of psychological weariness[8]. Due to the detrimental effects, it has on both businesses and their personnel, both researchers and practitioners are very interested in the topic concerning mental tiredness. Work-related weariness, or more specifically, feelings of weariness, negatively affects one's mindset and actions in workplace. Emotional fatigue has an impact on the efficiency of work and retainer rates. Maslach argues that mental weariness is the key component of emotional exhaustion. Job requirements for both the workplace and their private relationships are closely tied to psychological tiredness.

People who are showing signs of feelings of tiredness are unable to conceptually commit to their work. As outcomes of having been weighed down by their job, people experience emotionally tiredness. The start and the heart of the condition known as burnout are said to be psychological tiredness. Taking this a step even further sentimental tiredness is a symptom of diminished achievement perception that results in a pessimistic and dispassionate outlook on individuals. Additionally, another significant aspect of burnout is emotionally tiredness. Additionally, emotional fatigue represents the state of being experienced by people who are overworked and psychologically drained as a result of their positions.

Another factor to consider is emotional weariness. According to a consequence of feeling stressed by their job, people experience emotions tiredness. It classified as having feelings of weariness as its root cause[13]. Taking this a step more deeply, emotional tiredness is a symptom of diminished effectiveness perception which results in a pessimistic and critical perspective on individuals. Additionally, a highly significant aspect of stress is sentimental tiredness. Additionally, mental strain represents the state of being experienced by people who are overworked and physiologically drained as a result of satisfaction. In conclusion but not most importantly, sentimental tiredness lowers the level of satisfaction and organizational dedication were raising a high rate of purpose.

III. RESEARCH METHODOLOGY

A. Data Collections

The development of a Fuzzy Model approach was driven by the need to generate a unique fuzzy model for every participant based on actual data collected through well-structured surveys. In this particular case, data was collected from an average of 55 workers. Through internet resources, referrals from colleagues at other universities, and general public displays, we were able to enlist 55 male and female respondents who demonstrated fluency in English.

B. Fuzzy Analyzer Data

This theory follows the guideline by Dudzik et al. [1]. Several sentiments which individuals often experience are shown in Equations (1) and (2).

$$U=\{e1,e2,e3,e4\} \tag{1}$$

Where e1: Kindness (k), e2: Stress (s), e3: Angriness (a), e4: Happiness (h)

$$Decision = \sum_{intensity=g\,(ej),i=1.....5} offernsiveness \tag{2}$$

Where g (*ej*): generic value (Offensiveness),
i=1 randoms variables of feeling (Intensity)

Equation (3) represents the emotional fatigue of the state of being experienced by people who are overworked and psychologically drained as a result of their positions. The offensive behaviour class include:

$$\mu 0\ (i)\ \sup(\ \mu 0(\oiint \mu\ ei(u)du)) \tag{3}$$

Where (i) Happiness is high level,
((u) du) is the emotions can change based on culture (understanding of conversations and performance),
e1: Kindness (k), e2: Stress (s), e3: Angriness (a), e4: Happiness (h)

Equation (4) shows fundamental of all parameters are as intelligent emotion as happy, stressed, angry) are related to ultimate purpose can achieve the closest conceivable similarity between an individual's physical look and the expression at every instance of identification of facial parameters.

$$A(\mu) = \sum_{l=1}^{M} \mu, A, , B(\mu) = \sum_{i=1}^{M} \mu, B, B, a(\mu) = \sum_{i=1}^{m} \mu, C1 \tag{4}$$

Where (*A*): member of functions of instancy;
(*B,B,A*(*u*) emotions based on rules;
(*C1*) correct of emotions feeling and reacts.

$\mu 1(z)$is Normalized membership function satisfications

$$\mu 1 = \frac{\beta 1(Z)}{\sum_{i=1}^{m}, \delta 1(z) = \prod_{i=1}^{v} F(z), \mu 1 \gtrless 0} \tag{5}$$

Where ($\mu 1$) kind state are more smoother
(Z,F) is comparing among kindness, angriness, happiness and satisfactory
F li (zi) is the grade of membership of $z\ i$ in the fuzzy set F

Considering functions related to membership are typically linear relationships between the foundational parameters which include all or a portion of the conditional parameters, the Equation (6) is complex within an environment. In overall, the calculus of data based on observation is larger in scope than the mathematics of information based on measurement. H, the constrained variables, is capable of taking on numerous different configurations. Specifically, X=(X1,..., Xn) is an array variables for i=1 (B1).

$$\sum_{i=1}^{m} \mu(B-1), H(Q-1, \mu(z) = \sum_{i=1}^{m} \mu(z)B1 \tag{6}$$

Or

$$B(Z-1, \mu(z) = \sum_{i=1}^{n} Bj, (\mu)B-j, B(z-1, \mu(z)$$

$$\begin{bmatrix} 0 & 0 & g0 \\ 1 & 0 & gn=1 \\ 0 & 0 & g1 \end{bmatrix}, \quad \text{B1=} \quad \begin{matrix} b0 & g0 & 0 \\ b1 & g1, & 0 \\ bn & gn & 1 \end{matrix} \tag{7}$$

$$S\text{M} = [S]\ kidness, angry, happy, stress$$

The challenge is determining the facial expressions of people. Crucial facials feature configurations for the facial's behavior sequences.

Equation (7) provides the control signals for the facial engines. Obtaining an attribute that determines the relationship between an individual's and a facial expressions constitutes an essential challenge for appearance actions reconditioning [21]. The ultimate purpose can achieve the closest conceivable similarity between an individual's physical look and the expression at every instance. Researchers firstly extracted the facial points of interest from the facial image highlight by defined in order to obtain the countenance features. The sixty-nine facial characteristics which correspond to the facial foundations on a human face can be located using the developed countenance benchmark detectors found within the program module [21], see Figure 2.

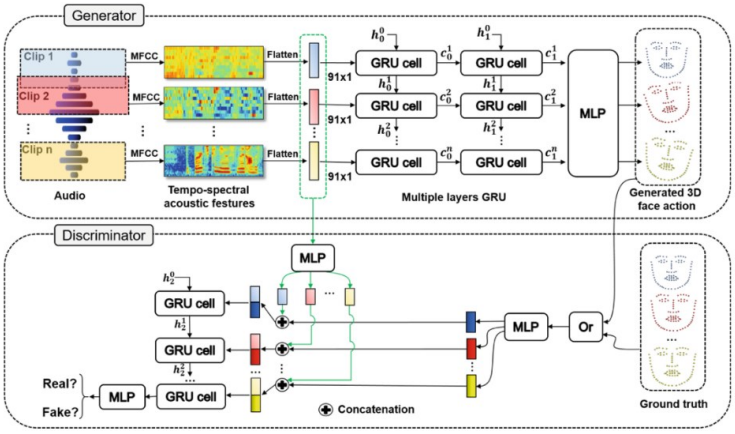

Figure 2. Emotional Intelligent [21]

A conversion of data from individual facial features activity to appearance. expression is what our countenance expression remarketing work entails. With just a handful of face sensors and actuators, the modeling goal is to resemble how the face of the individual looks. In this study, the synchronously created facial motion sequence and voice recordings are presented using a. For the control of facial physical attributes, there are four motors as needed (stress, happiness, eye contact and reactions) (refer to Equation (4)). The face's forehead and eyebrows can be moved upward or downward by one of the several driving mechanisms [22], as in Figure 3.

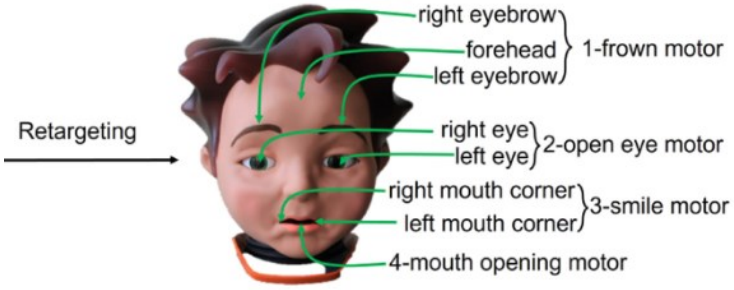

Figure 3. Facial Expressions [21]

The theoretical maximum height of the face react is able to be calculated by measuring the gap. As a consequence, Equation (8) displays the face huge scale.

$$S + \frac{H1+H2}{2yk1} + H1r + ykr \tag{8}$$

Where *h1,h2* is time of face's forehead and eyebrows;
ykr is measures based on information and experience.

A hypothetical division of H is the fuzzy sequence with the happy. If smiley has an association feature of extremely emotions, subsequently the meaning of "happy" for YK is given by Equation (9).

$$S = yk1 + \frac{h}{yk1+ykr/2} \tag{9}$$

To reduce the effects of different individuals in facial feature, evaluations on the results of division (ykl + ykr) as depicted in Equation (10).

$$S = \frac{H}{yk1+ykr/2} \tag{10}$$

where (s) gives an estimated intelligent emotions of S for yk = Facial Expressions types (happy, stress, angry).
(*yk1+yk2*) the combination statement generalization limitations methods are used in assumption using experiences.

Because of this, we may infer feelings of Facial Expressions (happy) movements, that are so swift when compared to deep emotions. Furthermore, as indicated in Equation (11), it is possible to acquire mouth area motion index. In this instance, (S smile) mouth is the length that distinguishes the midpoints of the fifty-second and seventh landmarks as well as sixty-seventh and fifty-eighth landmarks.

$$S\ smile\ 1 = \frac{D1}{yk1+yk1/2} \tag{11}$$

The (S smile) is the measurement of the understanding of conversation between individual performance via the 55 workers. In a comparable manner the (*S, yk1,2*) is the separation among the starting point of the horizontal via the 31st location and the 49th location, the normal fuzzy processing of feeling happy is displayed. Communities could have different ideas about what constitutes satisfaction, that is reflected in membership-related activities. Additionally, the law of cosine equations can be used to determine dl and dr. The measurement of the smiling engine, *S* smile, is obtained by taking the average difference between *S* smile and *S* smiler considering it requires simply a single smiling power to regulate each of the corners of the mouth.

IV. RESULTS AND DISCUSSIONS

The development was used to create speech-driven face motion pictures during the development stage. The facial controllers received commands instructions from the created countenance behaviors, which then appeared on the expressions together with the synchronized spoken audio recordings. We produced several films with communication audio and concurrent appearance, action using the resulting co-speech facial treatment behavior, and certain images in the developed countenance behavior succession.

Figure 5 illustrates how the produced social motion is causing a noticeable movement in the space between the mouth and eyebrow regions of the facial features. The individual eyebrow rarely changes since it rarely moves noticeably during normal conversations and expressive gestures, but rather with profoundly empathetic expression. Furthermore, data from the dataset indicates that while the research volunteers talk, their foreheads usually remain still. Mel-Frequency Cepstral Coefficients (MFCC) is often used for traditional language modelling when it comes to voice identification and other tasks requiring language audio.

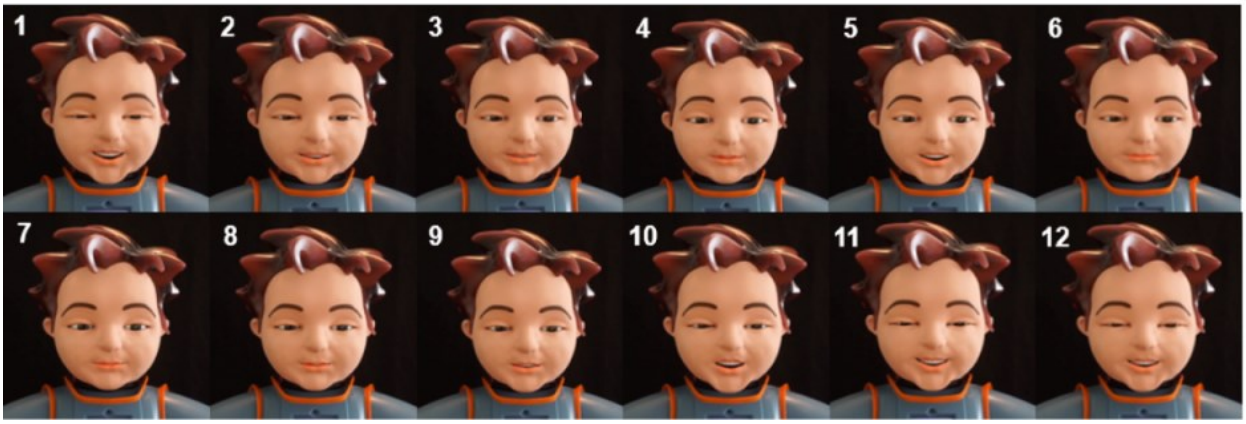

Figure 5. Facial Expressions Types

The MFCC characteristic of spoken recordings is the one that uses the production, which depends on the listener's hearing scale, in the range of frequencies in the field. In the detection challenge, MFCCs as frequency-dependent characteristics are significantly greater in precision than the time dimension highlights. Recognition of Face Components. We first extracted the 2face characteristics from the face picture emphasizing dominant to obtain the countenance features. A maximum of expression points of interest that correspond to the facial components on the human face are able to be located using the established face feature detection found within the module. The method of discrimination attempts to determine the degree to which the language recordings and facial expression succession are congruent. Several layers receive simulated versions of the sound recordings and the human facial action in a particular order, which are subsequently converted into 100-dimensional functions and 50-dimensional attributes, accordingly, for every single process. The two modal features in each time step are combined in the next synthesis level, whose result is passed to layering is used in the last to determine the possibility that the language recordings complement the facial treatment movement sequencing [23].

A. Simulation Results

The simulation for managing a connection with artificial intelligence is demonstrated in the following section. Figure 6 depicts the situation that occurred when the computerized machine politely requested that his arm be moved. The level of commitment of compassionate behavior is depicted by each curve with varying phase as well as magnitude.

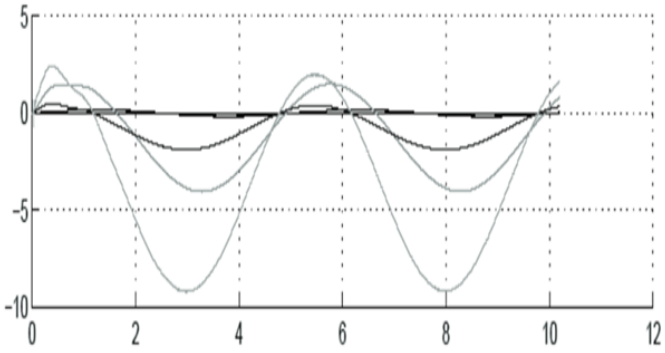

Figure 6. Kindness State

Anger is a different feeling that was successfully simulated and is depicted in Figure 7. The produced movements of a stressed-out individual are shown in this illustration as pointed circles in the controller's signaling device. The strength parameters affect the modulation signals approximately as an increase in the signal's perceived magnitude.

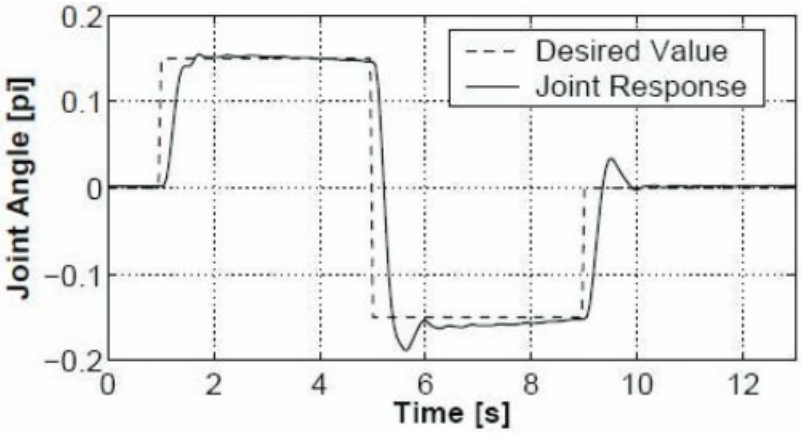

Figure7. Control Angriness States [1]

B. Perceived Emotional Intelligence

Figure 8 demonstrates that the investigators' overall assessment of the employees' PEI (5-point Likert scale, 1=low) is significantly influenced by configuration. The dependent is observed to have much greater interpersonal skills when compared with the dominant VA, in contrasting with the overall intelligence, and all are evaluated considerably more highly than the artificial intelligence counterpart; appropriately pairwise comparisons show p.001 in each of the instances.

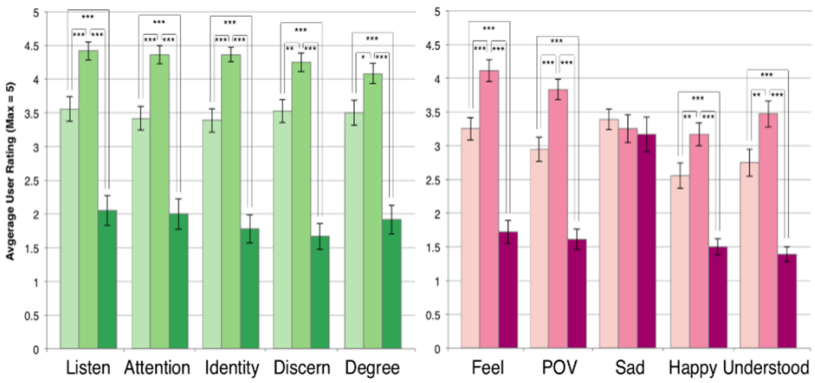

Figure 8. Perceived Emotional And Using Emotional

V. CONCLUSION

Acceleration behaviour is a typical area that is accurately understood based on a wide range of measurement kinds. One significant shortcoming of the existing approaches is that they do not address perception-based understanding of well-defined foundations. Yet, it lacks providing a detailed assumption describing the underlying emotions. In this paper, we propose combining EI with fuzzy logic to address the issue. In addition, the procedures for creating an artificial representation of emotional intelligence were examined in detail.

As the future work, we will investigate some significant applications and developments in fuzzy models. An in-depth experimental assessment will be carried out in order to enhance the model's accuracy.

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