

Data Speech Process of Iraqi People and the Development of Languages and Artificial Intelligence

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ABSTRACT

Language is a common tool for exchanging information. The acquisition, preservation, and processing of speech represent an important advance in the field of communication. The emergence and development of digital signal processing technology plays a positive role in promoting the development of communications technology. As a high-level interactive language, MATLAB has been widely used in various scientific fields due to its advantages in signal processing and matrix budgeting. Therefore, the analysis of speech signal denoising processing and simulation based on MATLAB has certain practical significance.

Keywords: Digital speech processing, MATLAB, The Iraqi dialect, Frequencies, Language developments, Artificial intelligence

INTRODUCTION

Vocal development is not voluntary, rather spontaneous. It occurs slowly and is imperceptible except after periods separated in time and place. Vocal development may differ from one country to another, but we will study the vocal development in Iraq (Al-Amiri & Al-Saighmi, 2007). I've always been very interested in the birth and evolution of our language. Arabic, so it is a pleasure to study our Arabic language, and the Arabic language is the same as in any languages, such as the Persian language, English, and other than the language, there are many dialects in it, and in this chapter we will study the Iraqi dialect. The Iraqi dialect is considered the closest dialect to the original Arabic language, so the Iraqis are distinguished by their rough voice. And high when they address each other, unlike other languages, and this is nothing as a result of the environment in which they grew up, as the environment imposes its characteristics on man, and man must adapt to it. Since ancient times, Iraqis and Arabs in general have been living in large areas of land, so they were forced to call out or speak in a voice. It is very loud so that it shortens the distances and the person they want to reach hears their speech. Therefore, those distances require a high voice, and this is what distinguishes them and distinguishes them from the rest of the dialects that have a soft voice. Therefore, we will mainly study the high voice in this research because it is a voice that mimics the Iraqi dialect and the high Iraqi voice, and this is what is observed. When anyone comes for a visit or tourism, especially to visit the Holy Monitor, we notice that Iraqis speak in a loud voice as a result of their influence on the surrounding environment. In this research, we will study their vocal frequencies well.

First, it must be through signals, tradition in which the Iraqi people are distinguished in their speech, which produces audio frequencies. Therefore, we will study this signals that result from them. We deal with them, process them, and analyze them in the MATLAB program, conceptual communication and over time and the acquisition of appropriate physical tools to make sounds first and then talk, qualitatively prompted us to occupy the superior breed of every living being. Speaking and communicating between human species, but above all growing neural networks within our brains, which in themselves correspond to any form of

communication in the universe regarding electrical pulses and energy concentration, has prepared us through different forms of language. To summarize, abbreviate and explain reality to us while enabling us to understand and return to unspoken forms such as alphabets, music and numbers to develop that language that we call science today.

THE DIFFERENCES BETWEEN THE DIALECTS OF THE IRAQI LANGUAGE AND THE EFFECT ON THE HUMAN VOICE FREQUENCY

Dialects in Iraq differ from one region to another. Each region has a specific dialect and a distinct language (Al-Shabibi, 2007). Depending on this region, the type of vocal pitch in it, some high vocal pitches are characteristic of females who live in the desert, desert, or vast rural areas, as we mentioned at the beginning of the research, these places, because of their remoteness and large area, are distinguished by their residents' high pitches of sound, so for example when a person calls One of the people is his colleague. The pitch that he uses on his own is a high pitch, because he is accustomed to this pitch through his life and living in those areas, which forced him to use those high pitches. This applies to people who live in rural areas and desert areas, and they are also distinguished by their rough accent, which... They are devoid of soft speech, unlike the second type of people who live in civilized cities, whose residents tend to speak softly and use low tones. Therefore, we find that when they speak, they speak with a realistic tone, unlike the first type, and this follows their way of living, the way they speak, and the style in which they were raised and brought up.

Therefore, it is appropriate to use high frequencies for people who live in the desert and vast rural areas because they use a high pitched voice, we will use high frequencies and low wavelengths according to the relationship ($f=v/\lambda$).

As for the second type, which has a soft and light tone in speech, it uses a natural to low pitch, so we will use low frequencies and high wavelengths.

In the first dialect in the desert and rural areas, we notice the amplification of letters among people, unlike city dwellers, whose dialect is usually gentle, close to a soft musical tone

GOALS AND TASK

One of the most important goals of experimental psychologists working to study language processing is to figure out how to do it. Complex brain processes work when language is understood, and in order to do so, a number of tasks and models have evolved to monitor, record, interpret and predict brain activity. In this section, a number of tasks and models of sound used to study language understanding will be discussed.

SPEECH PRODUCTION MECHANICS

The speech production process involves three subprocesses:

- source generation.
- articulation.
- radiation.

The human vocal organ complex consists of lungs, trachea, larynx, pharynx and nasal and oral cavities. The upper portion beginning with the larynx is called the vocal tract, which is changeable into various shapes by moving the jaw, tongue, lips and other internal parts. The nasal cavity is separated from the pharynx and oral cavity by raising the velum or soft palate (Moore, Dalley, & Agur, 2013).

LANGUAGE PROCESSING

When two people communicate with each other, it is necessary to achieve some conditions for successful communication between them (Moore, Dalley, & Agur, 2013). One of the first and most important of these conditions is the common language between the two

individuals and also that there is the initiative of the sending person who begins the dialogue and that there is a response from the receiving person and most importantly a result of the dialogue and communication. As we mentioned, the characteristic in which the Iraqis are distinguished is that the vocal pitch is high, so a similar system that mimics the high pitches must be chosen as shown in Figure 1.



Figure 1: Installation process

CREATING AND SAVING SOUND EFFECTS IN MATLAB

Let's create a simple cosine wave with frequency (f)

$$y(t)=\cos(2\pi ft)$$

$$y(t)=A \sin(2\pi ft+\phi)$$

Clear all

Close all

Cls

set the frequency

f=500;

create the waveform

fs=32000; sampling rate

d=s; duration of music

n=fs*d. number of sample

t=(1:n)/fs; total number of data points

y=cos(2*pi*f*t);

generate sound

sound (Y,fs);

file name ('sound.wav');

audio write (file name,y,fs)

SOUND

Sound is an automated frequency or wave capable of moving in a physical medium such as air, solid objects, liquids and gases and does not spread into a vacuum. Sound frequencies are essentially vibrations, which we can imagine as waves moving up and down at different speeds measured by hertz. Sound wave intensity is defined as the energy carried by the wave per second through the vertical spaces unit on the direction of the wave spread and measured by the dB unit. Sound produce by vibration of an object, these variations cause air molecules to oscillate. Change in air pressure creates a wave, oscillation that travels through space and energy travels from one point to another, the medium is deformed (Crochiere & Rabiner, 1983). Waveform carries multifactorial information such as frequency, intensity and Timbra.

```
>> {audio_data,fs}=audio read
```

```
>>sound (y,fs)
```

```
>>sound (audio_data*10,fs)
```

```
>>plot (audio_data)
```

>>audio write ('file name ', audio write, fs)

FREQUENCY AS THE NUMBER OF COMPLETED CYCLES PER SECOND.

$$f=1/T$$

High frequencies can reach 20,000 cycles per second

20000HZ=20KHZ

Higher frequency -> higher sound (Changjun, 2017)

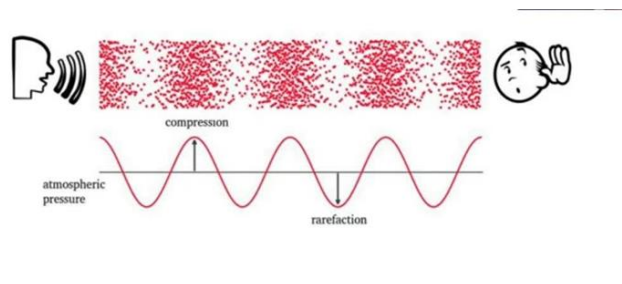


Figure 2: Physical properties of sound waves

AUDIO SIGNAL PROCESSING USING MATLAB

The intensive care unit works to receive critical cases of traffic accidents, internal cases, and cases that need special care after major surgeries, such as open heart operations. The intensive care room is equipped with a number of beds for the patient. The bed is equipped with a respirator that contains all the settings and receives all cases Focused on the screen, which will show blood pressure, oxygen and carbon dioxide levels.

Voice recording using laptop's in built microphone (single channel and 2 channels) or external microphone

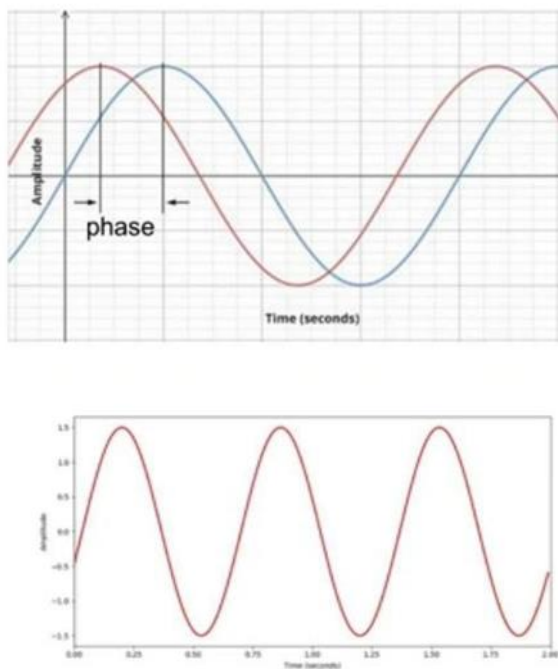


Figure 3: Sound waves

SIMULINK APPROACH

Recording audio using inbuilt laptop's microphone (signal & 2 channels) (Simulink, n.d.) as in the figure below

```

<<plot (yout)
<<sound (yout,44100)
<<plot (yout)
<<ch 1"yout (1,2);
<<ch 2"yout (1,2);
<<plot (ch1);
    
```

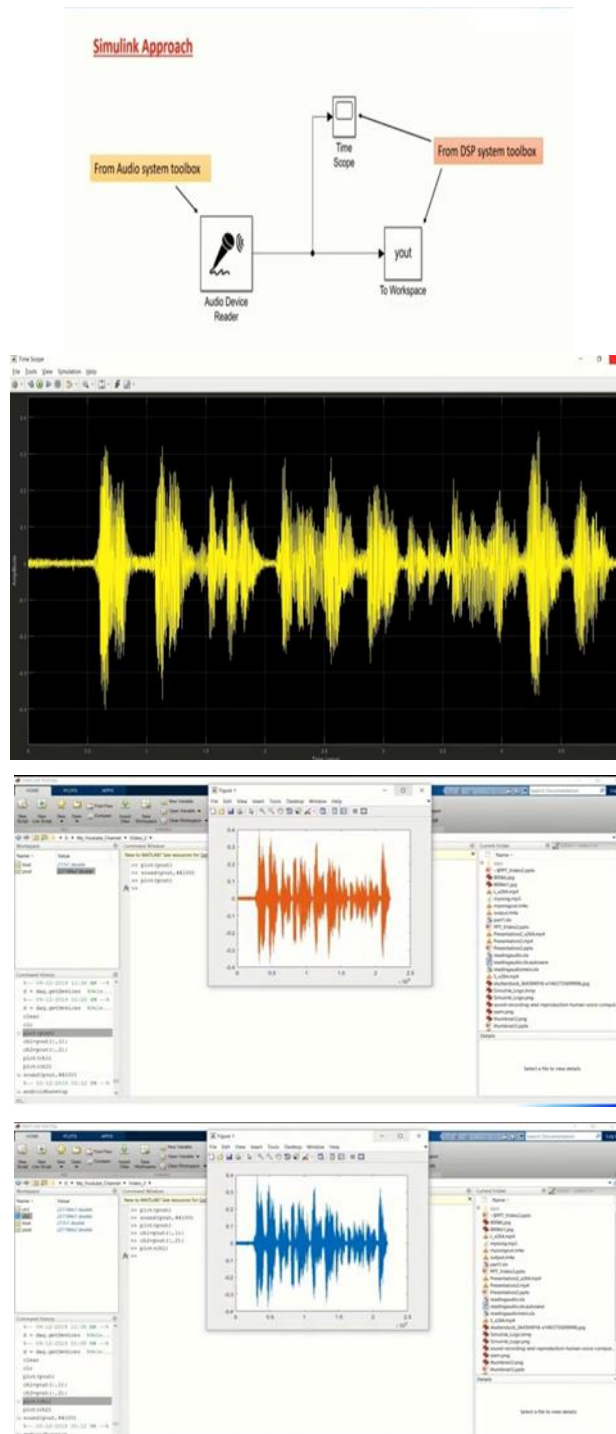


Figure 4: Recording audio using inbuilt laptop's microphone

Reading and writing audio files (using Simulink);
 <<sound (ch1,44100);

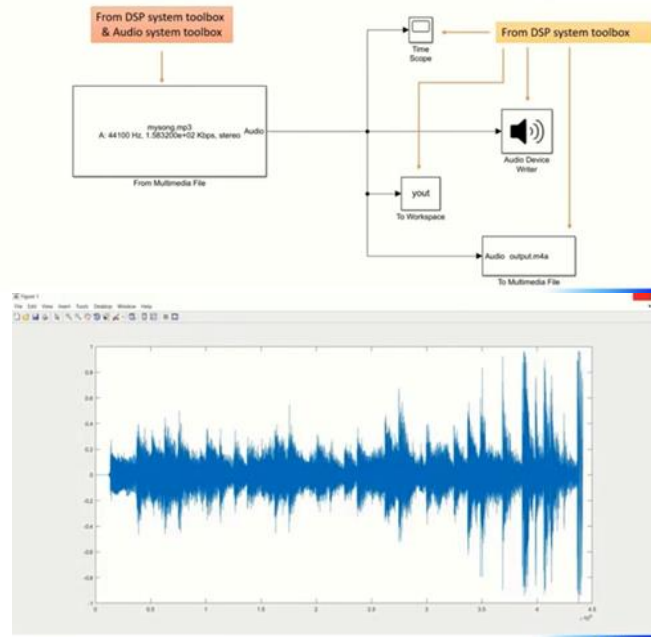


Figure 5: Reading and writing audio files

Recording audio from external sources via audio cable (using Simulink)

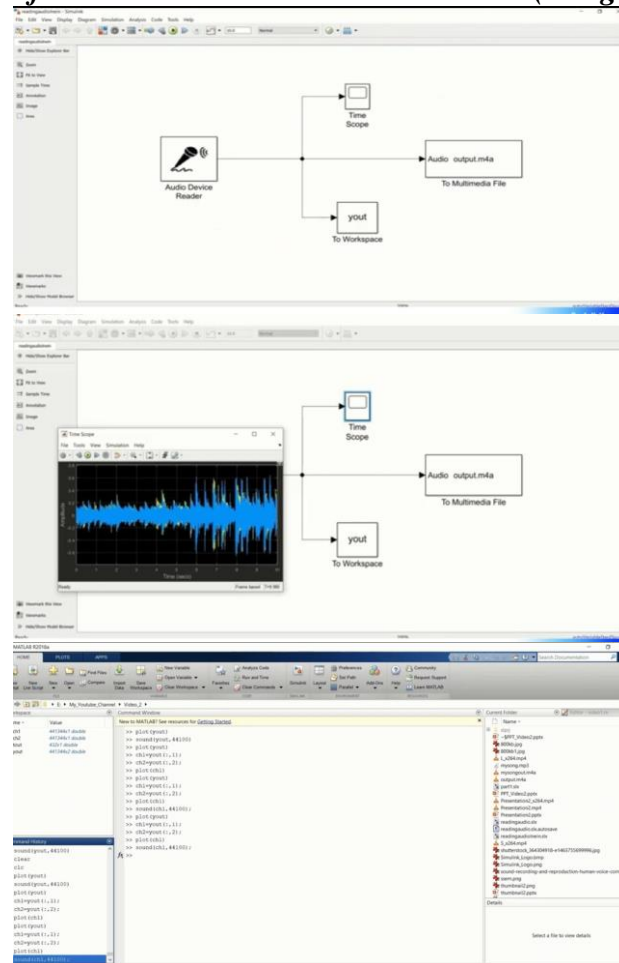


Figure 6: Recording audio from external sources via audio cable (using Simulink)

THE DEVELOPMENT OF LANGUAGES AND THE INTRODUCTION OF MODERN SCIENTIFIC TECHNOLOGY INTO THEM

Because we are talking about the Iraqi language and languages in general, the languages were not limited to being physical languages, but rather they developed tremendously at the hands of technicians, engineers, and pioneers of technical development, so that there is an artificial language through its frequencies and vibrations, and it can be used to form speech in any language and dialect we want, and this language is called adult in artificial intelligence. Sometimes they even recall the words and songs of people who died many years ago, and this is the pinnacle of scientific development in this field. There are many programming languages that we will talk and discuss, and the differences between them

DIFFERENCE BETWEEN ML AND NLP

The phrase "artificial intelligence" is frequently associated with complex concepts like machine learning, natural language processing, and deep learning, which are interrelated.

Machine learning and natural language processing are both components of artificial intelligence, but they differ significantly. As you are familiar with the term AI which is a technology that makes machines smart like humans, thus, machine learning is a branch of artificial intelligence that utilized statistical methods to tackle large data sets without any human involvement.

This technique enables the resolution of problems in a manner similar to how humans approach massive amounts of data.

Machine learning algorithms are highly effective in areas like natural language processing, computer, and robotics.

It's a valuable approach for addressing real world AI challenges as it involves algorithms that teach machines to learn and improve based on data without requiring explicit programming. On the other hand, natural language processing (NLP) is a sub-field of artificial intelligence that deals with processing raw written text in natural human languages and transforming it into a computer-readable format.

NLP is capable of performing intelligence analysis on vast amounts of plain text and producing valuable insights from it.

This technological revolution has revolutionized communication between humans and machines leading to the creation of innovative applications such as sentiment analysers, text classifiers, chatbots, and virtual assistants.

Virtual assistants like Siri and Alexa are some of the most well-known examples of NLP technology that we use daily.

Machine learning is frequently used to support natural language processing, additionally, NLP uses various preprocessing techniques such as:

1. **Tokenization:** A method to identify key components of sentences or words.
2. **POS Tagging:** A machine learning technique that identifies and tags parts of speech (nouns, verbs, etc) for entity extraction.
3. **Entity extraction:** A machine learning technique that extracts entities from text data.
4. **Lemmatization & stemming:** Techniques that simplify words to their basic form for easier analysis.
5. **Stop word removal:** A technique that removes commonly occurring words that do not add meaning to the analysis, such as "me", "them", and "have."

Natural language processing requires an understanding of how humans use language, including sarcasm, humor, and bias in different types of text data.

Machine learning algorithms can be used to automate the discovery of patterns in text data but first, unstructured text data must be converted into a structured format, such as a table.

Machine learning techniques for NLP involve using statistical methods to identify parts

of speech, sentiment, entities, etc.

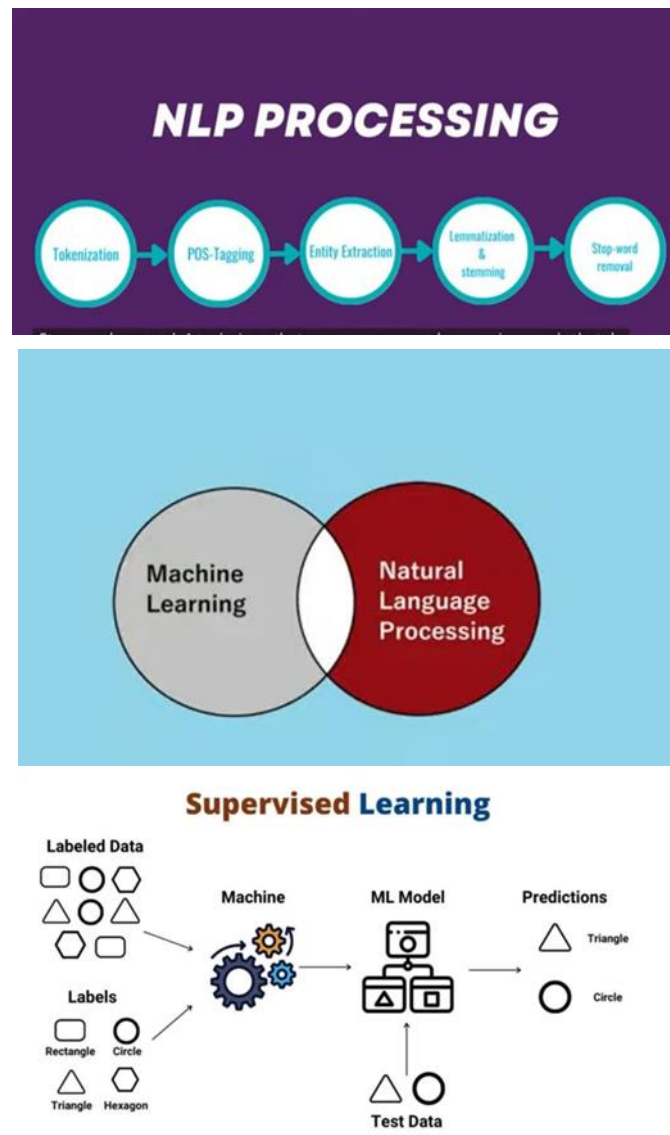


Figure 7: Development of languages and artificial intelligence

CONCLUSION

Language is of great importance in human life because it is the only means of communication between people. Therefore, it was necessary for researchers to study it and become familiar with it extensively. Like all languages, the Iraqi dialect has its share in this research and the disparity and difference between the dialects and tone of each region and another. Then we touched on the development of languages and their intervention in programming languages and artificial intelligence.

Where Machine learning and natural language processing are both integral parts of artificial intelligence, but they differ significantly. Machine learning involves the use of statistical method to analyze large datasets without human involvement, while natural language processing deals with transforming raw written readable format. Machine learning is crucial for NLP, as it provides the necessary Techniques to structure and analyze text data. In any type of research one of the most useful tools is the ability to perform research quickly and the efficiency of analyzing test results during the process of the development cycle. This analysis

includes several of plots and graphics which visually representative. Language machine such as plots, graphs, signal wave form, signal energy, spectral information, cepstral information and warping path all give valuable information to searchers of certain anomalies can only be detected in some charts. Furthermore, through the use of MATLAB GUI function, inter activity and event driven functionality have been inherited. This tool also clearly emphasis the educational aspect and not the benefit of the tool for research.

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