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RESEARCH TITLE

IDENTIFICATION OF COVID-19 PATIENTS THROUGH VOICE FOR MALE AGE GROUP USING AUTOCORRELATION TECHNIQUE

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Abstract

Proceeding from the importance of voice in practical life and its being included in many fields, we embarked on the idea of this project, which makes the computer a tool used to classify human voices and identify the speaker's identity, whether male or female, and then identify those infected with Covid-19 disease in Sudan, and this motive is The basis on which the researcher focused all his attention to try to reduce this problem by using one of the characteristics of sound, which is (frequency.). The main problem on which the study was based. How to identify COVID-19 disease by voice. The research aims to identify those infected with the COVID-19 virus for adult males in Sudan (Khartoum State) using the autocorrelation technique. The research relied on the sounds collected from isolation centers and Covid examination centers, and then processing this data using the automatic link technology to identify Covid disease by sound, using one of the characteristics of the sound, which is frequency. Through the research, the following results were reached: The success of the classification process for males infected with the Covid virus by voice, the system was also tested on 50 male samples, and the success rate of testing the system was 90%, while the error rate was 10%.

عنوان البحث

التعرف علي مرضي كوفيد-19 من خلال الصوت للفئة العمرية للذكور بإستخدام تقنية الإرتباط الذاتي Auto-Correlation

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المستخلص

انطلاقا من أهمية الصوت في الحياة العملية وكونه مدرجا في العديد من المجالات ، شرعنا في فكرة هذا المشروع الذي يجعل الكمبيوتر أداة تستخدم لتصنيف الأصوات البشرية والتعرف على هوية المتحدث سواء ذكر أو أنثى ومن ثم التعرف على المصابين بمرض كوفيد -19 في السودان ، وهذا الدافع هو الأساس الذي ركز عليه الباحث كل اهتمامه لمحاولة الحد من هذه المشكلة باستخدام إحدى خصائص الصوت وهي (التردد (،

والمشكلة الرئيسية التي استندت إليها الدراسة. كيفية التعرف على مرض كوفيد -19 من خلال الصوت. يهدف البحث إلى التعرف على المصابين بفيروس كوفيد -19 لفئة الذكور البالغين في السودان (ولاية الخرطوم) باستخدام تقنية الارتباط الذاتي.

اعتمد البحث على الأصوات التي تم جمعها من مراكز العزل ومراكز فحص كوفيد ، ومن ثم معالجة هذه البيانات باستخدام تقنية الارتباط التلقائي للتعرف على مرض كوفيد بالصوت ، باستخدام إحدى خصائص الصوت وهي التردد.

ومن خلال البحث تم التوصل إلى النتائج التالية: نجاح عملية التصنيف للذكور المصابين بفيروس كوفيد عن طريق الصوت ، كما تم اختبار النظام على 50 عينة ذكور ، وبلغت نسبة نجاح اختبار النظام 90٪ ، بينما بلغ كان معدل الخطأ 10٪.

1. Introduction:

The novel coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) originated in Wuhan City, Hubei Province, China, in December 2019 (21). SARS-CoV-2 dramatically expanded worldwide and on 11 March 2020 the WHO declared the outbreak of SARS-CoV-2 a pandemic (22). The COVID-19 pandemic has become a significant global public health concern. In particular, SARS-CoV-2 has spread faster than either SARS-CoV or Middle East respiratory syndrome coronavirus because of its high binding affinity to human receptors (23). The rapid spread of SARS-CoV-2 significantly increases the burden on a country's health-care system by raising the number of individuals seriously ill with COVID-19 and who need medical treatment (24).

The World Health Organization officially declared on January 30 that the outbreak of the virus constitutes a public health emergency of international concern, and confirmed the outbreak's transformation into a pandemic on March 11 (37)(38)(39). Another quickly is contagious, meaning it has a dynamic structure that spreads rapidly. The main features of this disease are coughing and respiratory symptoms as well as difficulty breathing, meaning it comes in the form of colds. The World Health Organization called this disease (corona virus 2019 disease), which is in short, COVID-19.

The clinical manifestation of COVID-19 ranges from asymptomatic to severe breathing difficulties and multi-organ failure (25). As reported by the CDC, a broad range of symptoms have been observed in individuals with COVID-19, ranging from minor symptoms to serious illness. Symptoms may occur 2–14 days after exposure to the virus, including fever or chills, cough, difficulty breathing, fatigue, muscle or body aches, headache, loss of taste or smell, sore throat, nausea or vomiting, and diarrhoea (26). SARS-CoV-2 can be transmitted via respiratory droplets following coughing or sneezing by an infected individual, between people within <1 m of each other, and potentially through touching surfaces contaminated with the virus, such as telephones or doorknobs (27). No effective antiviral therapy or vaccine has yet been developed. For patients diagnosed with COVID-19, it is recommended that appropriate symptomatic treatment and respiratory support be given (28)(29). Therefore, prevention is the only way to control the outbreak of COVID-19; the best prevention strategies for the community are to minimize the incidence of exposure to the virus, including the following: use of face masks, regular handwashing with soap or hand sanitizer containing at least 60% alcohol, avoiding contact with infected people and maintaining the appropriate distance as far as possible (30). Protection from or reduction of the transmission of SARS-CoV-2 may be achieved through the identification, isolation and follow up of infected patients. In addition, environmental disinfection and personal protective equipment for medical staff are used (31).

COVID-19 continues to expand globally, according to a WHO report, as of 3 July 2020 there were 10 710 005 cases and 517 877 deaths in 188 countries and territories. In Africa, the virus was first reported in mid-February 2020, and to 3 July 2020, more than 329 796 cases have been confirmed, with 6486 deaths (32). The pandemic is speeding up – it took 98 days to reach 100 000 cases and only 19 days to progress to 200 000 cases. Ten African countries have recently shown a massive increase in the

number of infected patients, making up for almost 80% of all cases in Africa. Over 70% of deaths have occurred in just five countries: Algeria, Egypt, Nigeria, South Africa and Sudan (32).

Sudan is the second largest country in Africa, with a total population of 43 849 260 (33), located in the northeastern part of Africa, neighboured by countries with a high number of COVID-19 cases, such asEgypt and the Gulf Arab countries. Before the announcement of the first case of COVID-19, the Sudan Federal Ministry of Health had strengthened the measures at entry points and, on 13 April, the government announced a partial lockdown. However, because of the weak application of these preventive measures, and the open borders of Sudan with neighbouring countries, these measures were not effective; a large number of people refused and escaped quarantine (34). To 3 July 2020, Sudan has witnessed community transmission of COVID-19, with new cases reported daily.

The first confirmed case of Corona virus was reported in Khartoum State, a man who died on March 12, 2020 who had visited the United Arab Emirates in the first week of March [35], on March 20, 2020, Sudan recorded the second infection with the Corona virus, A week after announcing the discovery of the first case of infection in the country and the death of its owner, a foreigner (whose nationality was not specified) in his forties, came to the country [36], which prompted the Sudanese government to follow after the procedures that worked to follow the quarantine policy (distancing). Social, reducing movement, curfew, reducing working hours and other measures) with the aim of limiting the epidemic and reducing injuries.

In order to adopt an accurate strategy to challenge this disease and prepare the health services against it, it was useful to pay attention to the topic of recognition such cases, because recognition models are one of the ways that help reveal a trend. And employing the other necessary resources to overcome this epidemic in an effective and timely manner, by directing all necessary interventions to mitigate the spread of this epidemic.

Recently, the importance of sound in practical life has emerged, as it enters into many fields, Including applications or areas of information security or other applications such as converting voice to written text or entering various computer commands by voice (3).As well as areas of artificial intelligence where it has many applications, whether it is general-purpose applications such as cognition and logical reasoning, or special-purpose tasks such as playing chess or medical diagnosis, experts and scientists often turn to artificial intelligence to save their experiences and experiences in which they spent their lives. The field of artificial intelligence world fit for all orientations. (2).

The researcher faced some difficulties in collecting information on the subject of the research, but, thank God, this research has been completed and produced, and he is familiar with a lot of information about the subject of research and the system has been successfully implemented and applied..

Common symptoms of the disease include fever, cough, fatigue, shortness of breath, loss of sense of smell and taste. The list of complications may include both pneumonia and acute respiratory distress syndrome the time between exposure to the virus and the onset of symptoms ranges from two to 14 days, with an average of five days, there is

no vaccine yet or an effective viral treatment against the emerging corona virus, and management of the disease is limited to treating the symptoms with the provision of supportive treatment.

Preventive recommendations include washing hands, covering the mouth when coughing, maintaining an adequate distance between individuals, wearing medical face masks in public places, and monitoring and self-isolating people suspected of being infected. The response of authorities around the world has included many measures such as imposing restrictions on movement Aviation, the implementation of general closures, the definition of occupational hazard controls, and the closure of facilities, many countries have also improved their ability to conduct tests and follow-up Patient contacts.

2.PROPOSED SYSTEM AND METHODS

The paper proposed a new method, which is to Recognition those infected with the Corona virus through voice using Auto-Correlation technology, and the focus was on one of the characteristics of sound, which is frequency, where the system measures the frequency of the sound. An indication of the covid-19 disease.

A. How the Proposed Solution work

The Covid classification system has multiple stages, focusing on one of the symptoms of the disease, which is sore throat, which is considered one of the highest rates that have been reported according to the study of the World Health Organization, to know the final result by which the male voice is classified (whether he has Covid disease or not) and the result Final through the fundamental frequency of the audio or input signal.

The proposed system operates in the following stages:

- Inputs stage.
- sampling stage
- Pre-processing stage
- Classification Covid stage

B. FUNCTIONAL FLOW DIAGRAM

The processing of model flow blew diagram figure 3.1.

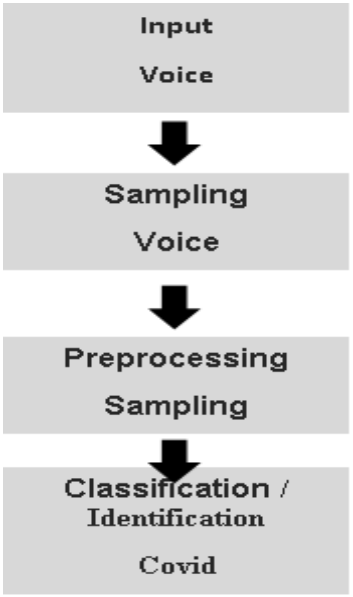


Figure 1: Shows the data flow diagram

The proposed system works in the following states:

1. **Inputs:**

At this stage, the system takes the audio signal to be categorized by either real-time recording or by bringing a saved load sound file. There are two ways of the input process, which are as follows:

- Real-time Record method.
- the method of fetching or fetching a saved audio file.

2. **Samples:**

the input signal is an analog signal, it is converted the analog signal into a digital signal.

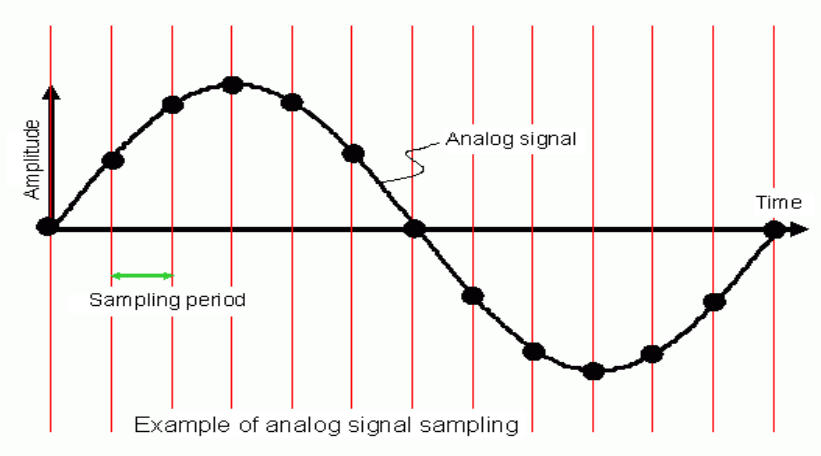


Figure 2: Show Analog of Signal Sampling

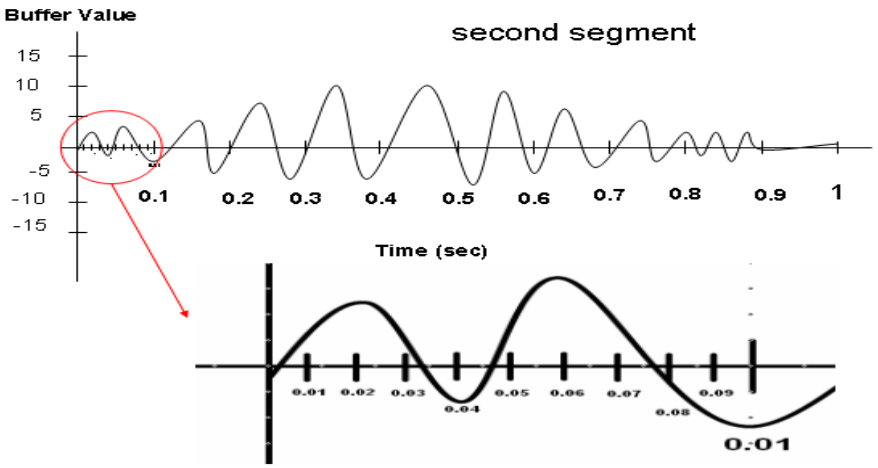


Figure 3:Show divide to samples

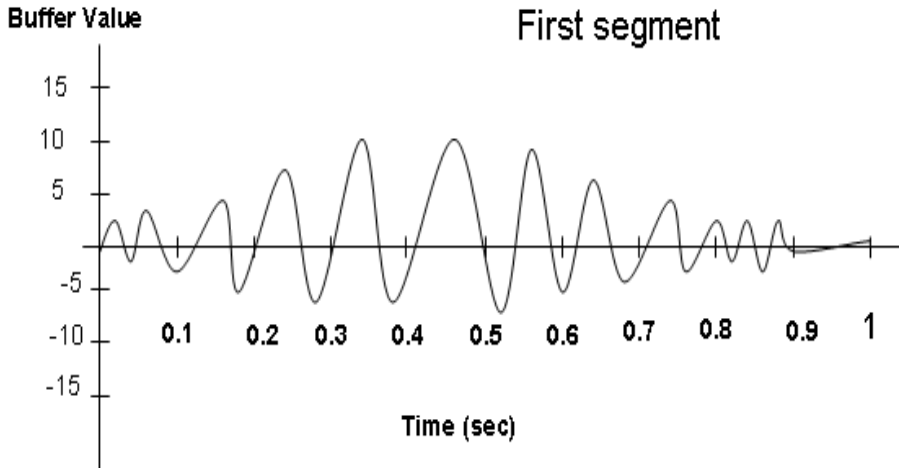
Form figure above If we take a fraction of an audio signal of 1 second and divide it by a division rate, let it be 10, we get 10 samples per second, then we divide the second into 10 fractions of a second over 10 divisions. Each of these divisions is called a sample.

From the above figure, we notice that the partition rate is small. When the audio signal is represented by the computer, the signal lacks accuracy and data loss occurs, so in order to avoid that we increase the partition rate from 10 to 100 samples per second, and thus we obtain a signal with high accuracy and avoid data loss. for a voice signal

Figure 3:Show Increase the splitting rate from 10 to 100 samples per second

3. Preprocessing:

The sound is filtered from noise or distortion so that the frequency is calculated more accurately



4. Classification:

This stage is considered one of the most important. At this point, the basic frequency of the audio signal is calculated, through which the process of classifying whether a person has Covid disease or not is carried out.

3.IMPLEMENTATION AND EVOLUTION OF SYSTEM

We have implemented these techniques in Matlab software and the Auto-Correlation. Consequently, it is important to decide the most suitable approach to be applied. As defined before, there are several stages to perform of the COVID-19 system.

We have selected 200 samples randomly, 50 of them were classified as males by their voice who not have covid-19 and the other 150 were classified as males with COVID-19 disease from the adult category that the system aims to classify by their voices and frequencies.

The difference images are shown in below figures where classify the voices by frequencies using Auto-Correlation.

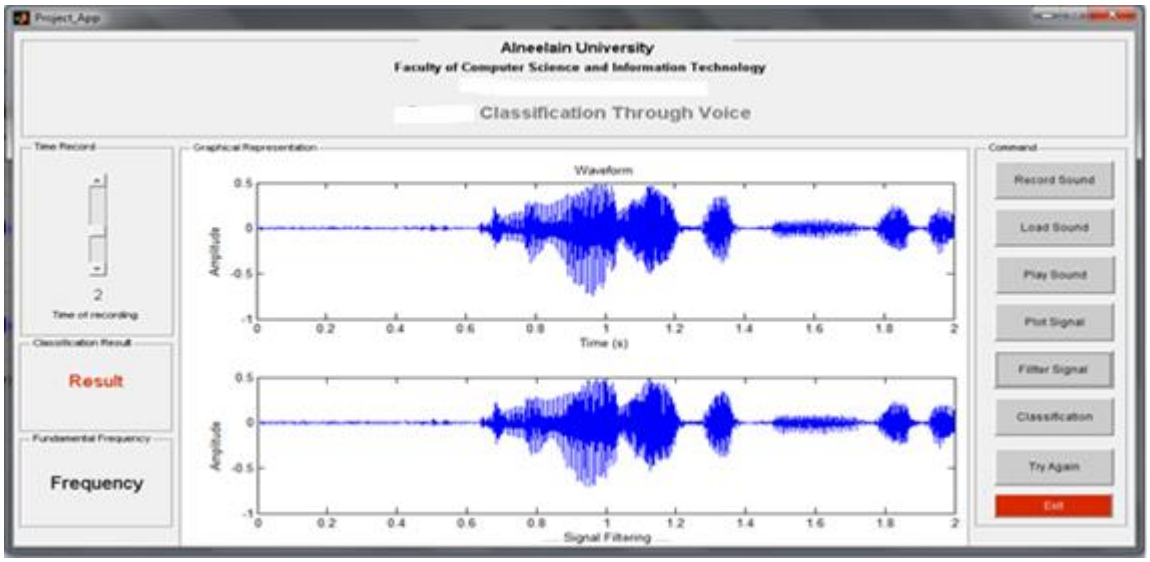


Figure 2: record sample and filtering

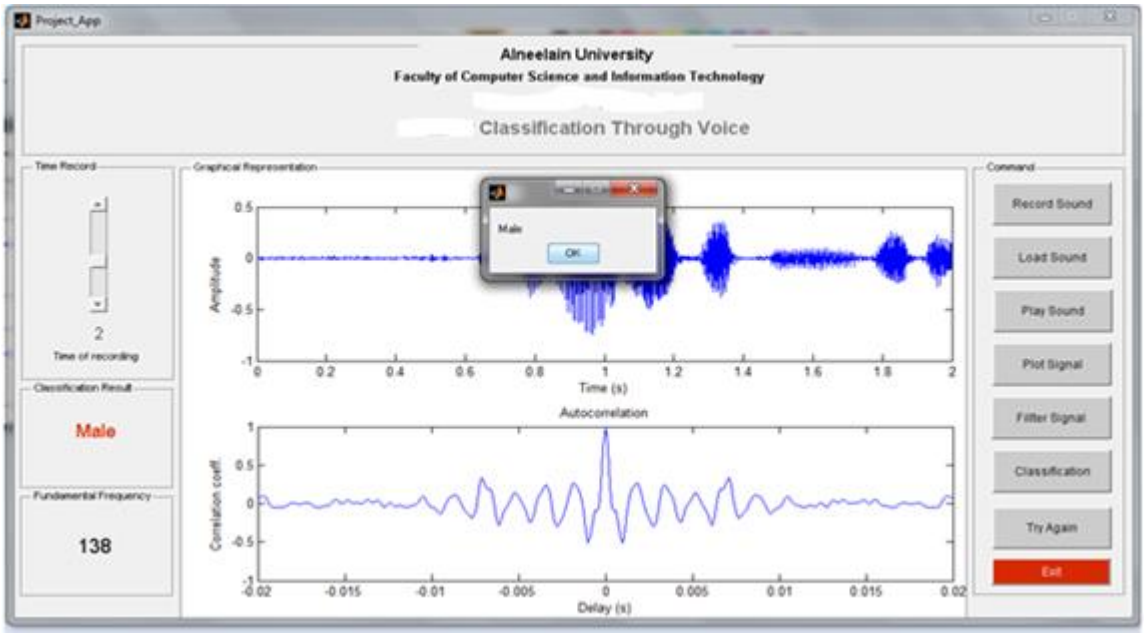


Figure 3: Classification result **MALE** Not have a Covid-19.

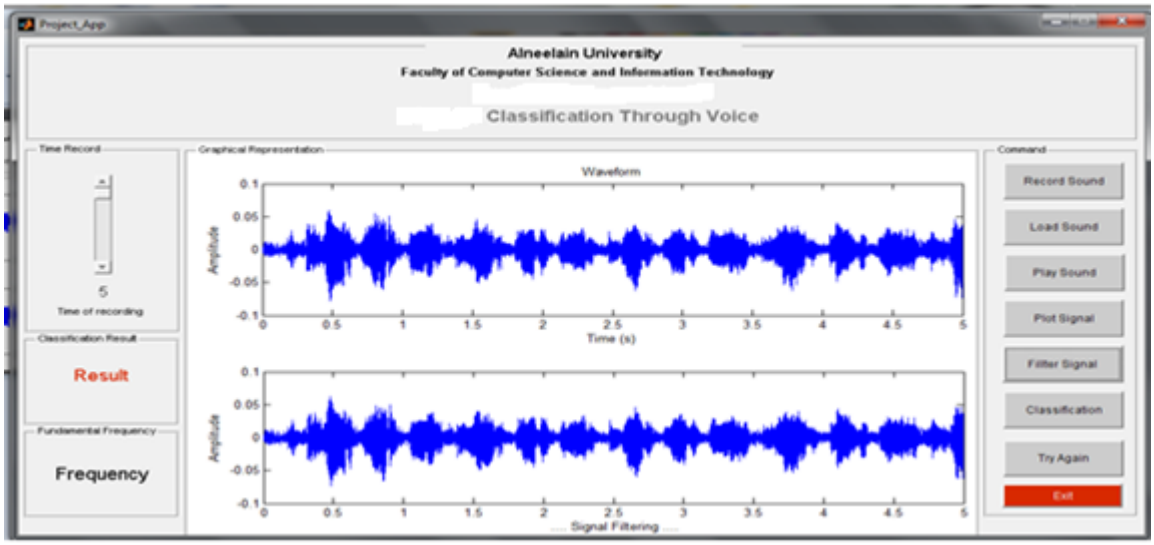


Figure 4: record sample and filtering

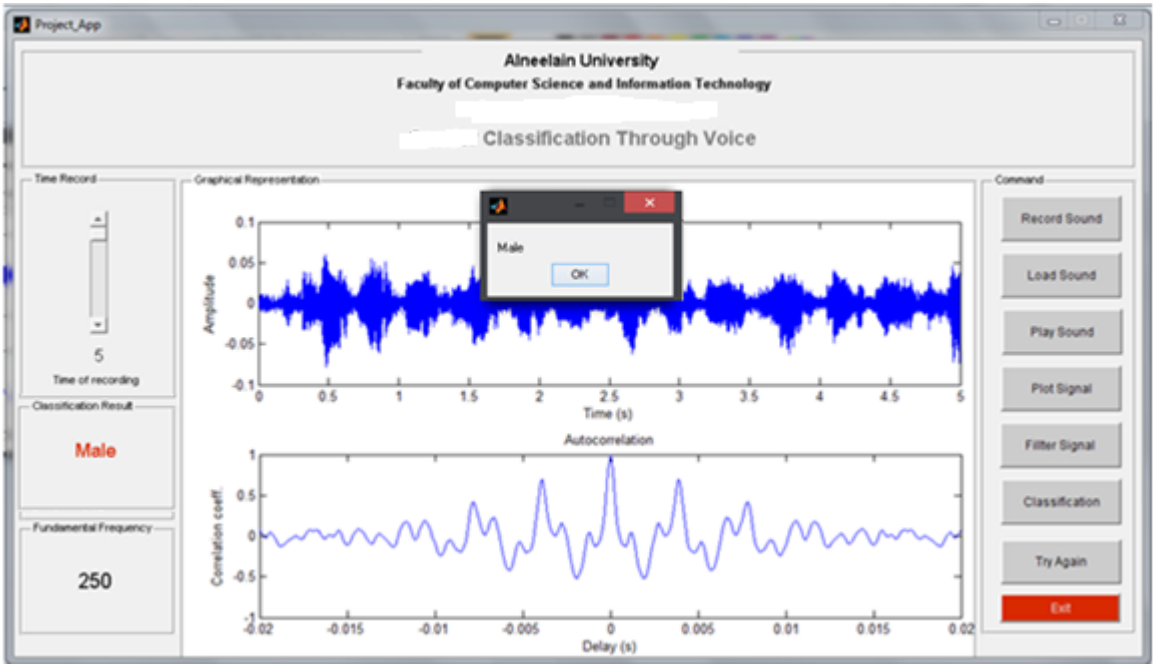


Figure 5: Classification result **MALE** with COVID-19.

Table 1: Some Sample diagnosed results and status.

الحالة	نتيجة التصنيف مرض كوفيد-19	تردد العينة	التردد الطبيعي للإناث	التردد الطبيعي للذكور	الجنس	الرقم
True	Male	138	166 – 250 Hz	65 – 165 Hz	Male	1
True	Male	167	166 – 250 Hz	65 – 165 Hz	Male	2
True	Male	138	166 – 250 Hz	65 – 165 Hz	Male	3
True	Male	105	166 – 250 Hz	65 – 165 Hz	Male	4
True	Male	154	166 – 250 Hz	65 – 165 Hz	Male	5
True	Male	174	166 – 250 Hz	65 – 165 Hz	Male	6
True	Male	129	166 – 250 Hz	65 – 165 Hz	Male	7
True	Male	163	166 – 250 Hz	65 – 165 Hz	Male	8
True	Male	127	166 – 250 Hz	65 – 165 Hz	Male	9
True	Male	110	166 – 250 Hz	65 – 165 Hz	Male	10
False	Male- Covid	250	166 – 250 Hz	65 – 165 Hz	Male	11
True	Male	157	166 – 250 Hz	65 – 165 Hz	Male	12
True	Male	145	166 – 250 Hz	65 – 165 Hz	Male	13
False	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	14
True	Male Covid	167	166 – 250 Hz	65 – 165 Hz	Male	15
True	Male Covid	250	166 – 250 Hz	65 – 165 Hz	Male	16
True	Male Covid	205	166 – 250 Hz	65 – 165 Hz	Male	17
True	Male Covid	250	166 – 250 Hz	65 – 165 Hz	Male	18
True	Male Covid	242	166 – 250 Hz	65 – 165 Hz	Male	19
True	Male Covid	235	166 – 250 Hz	65 – 165 Hz	Male	20

True	Male Covid	211	166 – 250 Hz	65 – 165 Hz	Male	21
True	Male Covid	222	166 – 250 Hz	65 – 165 Hz	Male	22
True	Male Covid	211	166 – 250 Hz	65 – 165 Hz	Male	23
True	Male Covid	222	166 – 250 Hz	65 – 165 Hz	Male	24
False	Male-Covid	235	166 – 250 Hz	65 – 165 Hz	Male	25
True	Male Covid	229	166 – 250 Hz	65 – 165 Hz	Male	26
True	Male Covid	250	166 – 250 Hz	65 – 165 Hz	Male	27
True	Male Covid	211	166 – 250 Hz	65 – 165 Hz	Male	28
True	Male Covid	229	166 – 250 Hz	65 – 165 Hz	Male	29
True	Male Covid	195	166 – 250 Hz	65 – 165 Hz	Male	30
True	Male Covid	195	166 – 250 Hz	65 – 165 Hz	Male	31
True	Male Covid	186	166 – 250 Hz	65 – 165 Hz	Male	32
True	Male Covid	169	166 – 250 Hz	65 – 165 Hz	Male	33
True	Male Covid	199	166 – 250 Hz	65 – 165 Hz	Male	34
True	Male Covid	200	166 – 250 Hz	65 – 165 Hz	Male	35
True	Male Covid	182	166 – 250 Hz	65 – 165 Hz	Male	36
True	Male Covid	171	166 – 250 Hz	65 – 165 Hz	Male	37
True	Male Covid	183	166 – 250 Hz	65 – 165 Hz	Male	38
True	Male Covid	202	166 – 250 Hz	65 – 165 Hz	Male	39
True	Male Covid	167	166 – 250 Hz	65 – 165 Hz	Male	40
True	Male Covid	244	166 – 250 Hz	65 – 165 Hz	Male	41
True	Male Covid	218	166 – 250 Hz	65 – 165 Hz	Male	42
True	Male Covid	227	166 – 250 Hz	65 – 165 Hz	Male	43
True	Male Covid	200	166 – 250 Hz	65 – 165 Hz	Male	44
True	Male Covid	209	166 – 250 Hz	65 – 165 Hz	Male	45
True	Male Covid	239	166 – 250 Hz	65 – 165 Hz	Male	46
True	Male Covid	198	166 – 250 Hz	65 – 165 Hz	Male	47
True	Male Covid	185	166 – 250 Hz	65 – 165 Hz	Male	48
True	Male Covid	215	166 – 250 Hz	65 – 165 Hz	Male	49
True	Male Covid	241	166 – 250 Hz	65 – 165 Hz	Male	50
True	Male Covid	222	166 – 250 Hz	65 – 165 Hz	Male	51
True	Male Covid	236	166 – 250 Hz	65 – 165 Hz	Male	52
True	Male Covid	187	166 – 250 Hz	65 – 165 Hz	Male	53
True	Male Covid	171	166 – 250 Hz	65 – 165 Hz	Male	54
True	Male Covid	169	166 – 250 Hz	65 – 165 Hz	Male	55
True	Male Covid	211	166 – 250 Hz	65 – 165 Hz	Male	56
True	Male Covid	214	166 – 250 Hz	65 – 165 Hz	Male	57

True	Male Covid	171	166 – 250 Hz	65 – 165 Hz	Male	58
True	Male Covid	188	166 – 250 Hz	65 – 165 Hz	Male	59
True	Male Covid	204	166 – 250 Hz	65 – 165 Hz	Male	60
True	Male	67	166 – 250 Hz	65 – 165 Hz	Male	61
True	Male	95	166 – 250 Hz	65 – 165 Hz	Male	62
True	Male	100	166 – 250 Hz	65 – 165 Hz	Male	63
True	Male	79	166 – 250 Hz	65 – 165 Hz	Male	64
True	Male	113	166 – 250 Hz	65 – 165 Hz	Male	65
True	Male	143	166 – 250 Hz	65 – 165 Hz	Male	66
True	Male	150	166 – 250 Hz	65 – 165 Hz	Male	67
True	Male	128	166 – 250 Hz	65 – 165 Hz	Male	68
True	Male	99	166 – 250 Hz	65 – 165 Hz	Male	69
True	Male	65	166 – 250 Hz	65 – 165 Hz	Male	70
True	Male	103	166 – 250 Hz	65 – 165 Hz	Male	71
True	Male	118	166 – 250 Hz	65 – 165 Hz	Male	72
True	Male	129	166 – 250 Hz	65 – 165 Hz	Male	73
True	Male	110	166 – 250 Hz	65 – 165 Hz	Male	74
True	Male	100	166 – 250 Hz	65 – 165 Hz	Male	75
True	Male	135	166 – 250 Hz	65 – 165 Hz	Male	76
True	Male	131	166 – 250 Hz	65 – 165 Hz	Male	77
True	Male	124	166 – 250 Hz	65 – 165 Hz	Male	78
True	Male	140	166 – 250 Hz	65 – 165 Hz	Male	79
True	Male	163	166 – 250 Hz	65 – 165 Hz	Male	80
True	Male	160	166 – 250 Hz	65 – 165 Hz	Male	81
True	Male	114	166 – 250 Hz	65 – 165 Hz	Male	82
True	Male	106	166 – 250 Hz	65 – 165 Hz	Male	83
True	Male	144	166 – 250 Hz	65 – 165 Hz	Male	84
True	Male	99	166 – 250 Hz	65 – 165 Hz	Male	85
True	Male	71	166 – 250 Hz	65 – 165 Hz	Male	86
True	Male	83	166 – 250 Hz	65 – 165 Hz	Male	87
True	Male	118	166 – 250 Hz	65 – 165 Hz	Male	88
True	Male	127	166 – 250 Hz	65 – 165 Hz	Male	89
True	Male	139	166 – 250 Hz	65 – 165 Hz	Male	90
True	Male	135	166 – 250 Hz	65 – 165 Hz	Male	91
True	Male	141	166 – 250 Hz	65 – 165 Hz	Male	92
True	Male	110	166 – 250 Hz	65 – 165 Hz	Male	93
True	Male	100	166 – 250 Hz	65 – 165 Hz	Male	94

True	Male	164	166 – 250 Hz	65 – 165 Hz	Male	95
True	Male	151	166 – 250 Hz	65 – 165 Hz	Male	96
True	Male	115	166 – 250 Hz	65 – 165 Hz	Male	97
True	Male	122	166 – 250 Hz	65 – 165 Hz	Male	98
True	Male	119	166 – 250 Hz	65 – 165 Hz	Male	99
True	Male	132	166 – 250 Hz	65 – 165 Hz	Male	100
True	Male-Covid	169	166 – 250 Hz	65 – 165 Hz	Male	101
True	Male-Covid	220	166 – 250 Hz	65 – 165 Hz	Male	102
True	Male-Covid	212	166 – 250 Hz	65 – 165 Hz	Male	103
True	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	104
True	Male-Covid	250	166 – 250 Hz	65 – 165 Hz	Male	105
True	Male-Covid	235	166 – 250 Hz	65 – 165 Hz	Male	106
True	Male-Covid	212	166 – 250 Hz	65 – 165 Hz	Male	107
True	Male-covid	221	166 – 250 Hz	65 – 165 Hz	Male	108
True	Male-Covid	205	166 – 250 Hz	65 – 165 Hz	Male	109
True	Male-covid	199	166 – 250 Hz	65 – 165 Hz	Male	110
True	Male-Covid	178	166 – 250 Hz	65 – 165 Hz	Male	111
True	Male-Covid	169	166 – 250 Hz	65 – 165 Hz	Male	112
True	Male-Covid	208	166 – 250 Hz	65 – 165 Hz	Male	113
True	Male-Covid	219	166 – 250 Hz	65 – 165 Hz	Male	114
True	Male-Covid	233	166 – 250 Hz	65 – 165 Hz	Male	115
True	Male-Covid	166	166 – 250 Hz	65 – 165 Hz	Male	116
True	Male-Covid	249	166 – 250 Hz	65 – 165 Hz	Male	117
True	Male-Covid	211	166 – 250 Hz	65 – 165 Hz	Male	118
True	Male-Covid	203	166 – 250 Hz	65 – 165 Hz	Male	119
True	Male-Covid	248	166 – 250 Hz	65 – 165 Hz	Male	120
True	Male-Covid	201	166 – 250 Hz	65 – 165 Hz	Male	121
True	Male-Covid	185	166 – 250 Hz	65 – 165 Hz	Male	122
True	Male-Covid	178	166 – 250 Hz	65 – 165 Hz	Male	123
True	Male-Covid	191	166 – 250 Hz	65 – 165 Hz	Male	124
True	Male-Covid	224	166 – 250 Hz	65 – 165 Hz	Male	125
True	Male-Covid	248	166 – 250 Hz	65 – 165 Hz	Male	126
True	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	127
True	Male-Covid	202	166 – 250 Hz	65 – 165 Hz	Male	128
True	Male-Covid	250	166 – 250 Hz	65 – 165 Hz	Male	129
True	Male-Covid	244	166 – 250 Hz	65 – 165 Hz	Male	130
True	Male-Covid	239	166 – 250 Hz	65 – 165 Hz	Male	131

True	Male-Covid	226	166 – 250 Hz	65 – 165 Hz	Male	132
True	Male-Covid	218	166 – 250 Hz	65 – 165 Hz	Male	133
True	Male-Covid	210	166 – 250 Hz	65 – 165 Hz	Male	134
True	Male-Covid	183	166 – 250 Hz	65 – 165 Hz	Male	135
True	Male-Covid	168	166 – 250 Hz	65 – 165 Hz	Male	136
True	Male-Covid	215	166 – 250 Hz	65 – 165 Hz	Male	137
True	Male-Covid	232	166 – 250 Hz	65 – 165 Hz	Male	138
True	Male-Covid	246	166 – 250 Hz	65 – 165 Hz	Male	139
True	Male-Covid	209	166 – 250 Hz	65 – 165 Hz	Male	140
True	Male-Covid	211	166 – 250 Hz	65 – 165 Hz	Male	141
True	Male-Covid	168	166 – 250 Hz	65 – 165 Hz	Male	142
True	Male-Covid	195	166 – 250 Hz	65 – 165 Hz	Male	143
True	Male-Covid	202	166 – 250 Hz	65 – 165 Hz	Male	144
True	Male-Covid	214	166 – 250 Hz	65 – 165 Hz	Male	145
True	Male-Covid	242	166 – 250 Hz	65 – 165 Hz	Male	146
True	Male-Covid	233	166 – 250 Hz	65 – 165 Hz	Male	147
True	Male-Covid	231	166 – 250 Hz	65 – 165 Hz	Male	148
True	Male-Covid	219	166 – 250 Hz	65 – 165 Hz	Male	149
True	Male-Covid	237	166 – 250 Hz	65 – 165 Hz	Male	150
True	Male-Covid	230	166 – 250 Hz	65 – 165 Hz	Male	151
True	Male-Covid	205	166 – 250 Hz	65 – 165 Hz	Male	152
True	Male-Covid	199	166 – 250 Hz	65 – 165 Hz	Male	153
True	Male-Covid	211	166 – 250 Hz	65 – 165 Hz	Male	154
True	Male-Covid	204	166 – 250 Hz	65 – 165 Hz	Male	155
True	Male-Covid	223	166 – 250 Hz	65 – 165 Hz	Male	156
True	Male-Covid	244	166 – 250 Hz	65 – 165 Hz	Male	157
True	Male-Covid	250	166 – 250 Hz	65 – 165 Hz	Male	158
True	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	159
True	Male-Covid	181	166 – 250 Hz	65 – 165 Hz	Male	16
True	Male-Covid	167	166 – 250 Hz	65 – 165 Hz	Male	161
True	Male-Covid	204	166 – 250 Hz	65 – 165 Hz	Male	162
True	Male-Covid	194	166 – 250 Hz	65 – 165 Hz	Male	163
True	Male-Covid	227	166 – 250 Hz	65 – 165 Hz	Male	164
True	Male-Covid	239	166 – 250 Hz	65 – 165 Hz	Male	165
True	Male-Covid	234	166 – 250 Hz	65 – 165 Hz	Male	166
True	Male-Covid	247	166 – 250 Hz	65 – 165 Hz	Male	167
True	Male-Covid	219	166 – 250 Hz	65 – 165 Hz	Male	168

True	Male-Covid	201	166 – 250 Hz	65 – 165 Hz	Male	169
True	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	170
True	Male-Covid	245	166 – 250 Hz	65 – 165 Hz	Male	171
True	Male-Covid	231	166 – 250 Hz	65 – 165 Hz	Male	172
True	Male-Covid	214	166 – 250 Hz	65 – 165 Hz	Male	17173
True	Male-Covid	221	166 – 250 Hz	65 – 165 Hz	Male	174
True	Male-Covid	206	166 – 250 Hz	65 – 165 Hz	Male	175
True	Male-Covid	175	166 – 250 Hz	65 – 165 Hz	Male	176
True	Male-Covid	187	166 – 250 Hz	65 – 165 Hz	Male	177
True	Male-Covid	193	166 – 250 Hz	65 – 165 Hz	Male	178
True	Male-Covid	211	166 – 250 Hz	65 – 165 Hz	Male	179
True	Male-Covid	222	166 – 250 Hz	65 – 165 Hz	Male	180
True	Male-Covid	210	166 – 250 Hz	65 – 165 Hz	Male	181
True	Male-Covid	169	166 – 250 Hz	65 – 165 Hz	Male	182
True	Male-Covid	237	166 – 250 Hz	65 – 165 Hz	Male	183
True	Male-Covid	220	166 – 250 Hz	65 – 165 Hz	Male	184
True	Male-Covid	231	166 – 250 Hz	65 – 165 Hz	Male	185
True	Male-Covid	177	166 – 250 Hz	65 – 165 Hz	Male	186
True	Male-Covid	169	166 – 250 Hz	65 – 165 Hz	Male	187
True	Male-Covid	209	166 – 250 Hz	65 – 165 Hz	Male	188
True	Male-Covid	234	166 – 250 Hz	65 – 165 Hz	Male	189
True	Male-Covid	212	166 – 250 Hz	65 – 165 Hz	Male	190
True	Male-Covid	216	166 – 250 Hz	65 – 165 Hz	Male	191
True	Male-Covid	199	166 – 250 Hz	65 – 165 Hz	Male	192
True	Male-Covid	167	166 – 250 Hz	65 – 165 Hz	Male	193
True	Male-Covid	185	166 – 250 Hz	65 – 165 Hz	Male	194
True	Male-Covid	224	166 – 250 Hz	65 – 165 Hz	Male	195
True	Male-Covid	249	166 – 250 Hz	65 – 165 Hz	Male	196
True	Male-Covid	250	166 – 250 Hz	65 – 165 Hz	Male	197
True	Male-Covid	200	166 – 250 Hz	65 – 165 Hz	Male	198
True	Male-Covid	211	166 – 250 Hz	65 – 165 Hz	Male	199
True	Male-Covid	234	166 – 250 Hz	65 – 165 Hz	Male	200

Table 2: shows frequency and percent of health and positive samples.

	Frequency	Percent
Male not have a covid-19	50	43.30%
Male – Covid	150	46.70%
False Percent For Male – Covid	3	6.67%
Total	200	100%

4. Conclusions:

In this paper study, overview and background about voise system and covid-19 were presented. The voice is helpful to to dignaosis the covid-19, to distinguish between the frequence sound of COVID-19 positive people and that of healthy people.

The paper study is implemented the new method to diagnosis COVID-19 using Auto-Correlation system based on frequencies for voice . Because the covid-19 system has advantage over use the normal digonstic techiqe such as fever and cough digonstic technique. Therefore, the covid-19 system features of the Auto-Correlation technique will be optimized using frequencies. The proposed systems the real world needs a more efficient system to improve digonstic method in medcien filed.

In this paper, an efficient technique has been presented for diagnosis covid-19 using Auto-Correlation system based on frequencies for voice. In the experimental results, it is found that the frequencies of voice minimal changes compare with original voice was excellent without altering its quality. So, diagnosis COVID-19 using Auto-Correlation system based on frequencies for voice provides new digonstic techniqe.

5.Future work:

Some idea is provided in this paper for future work. The future work is some suggestion to improve the proposed approach to arrange the female voice, and to improve a new technique for classification.

Finally, the proposed technique is applied on male voice. To conducted the witness of the effectiveness for proposed technique on female.

6. RESULTS:

- The success of the classification process for males infected with Covid by voice,
- the system was tested on 50 male samples, and the success rate of testing the system was 90%, while the error rate was 10%
- The system's classification results for male COVID-19 voices are more accurate.

- The system was applied to the female category, and the results were ina.ccurate due to the sharpness of the voice in females.
- The more the recorded audio signal is free of noise and distortion, the more accurate the results will be.
- Noise, noise, and microphone quality directly affect the rating system results, leading to inaccurate results.
- The efficiency of the autocorrelation technique in calculating the value of the signal frequency.

7. DISCUSSION:

Using a wide variety of human voices from the target group gives better results and better evaluation of the system, In this system, the adult male category was targeted to find out their infection with Covid, so the system recommends integrating mechanisms to be able to classify the age group of females as a whole, The system was applied to the adult male category only, as it was applied to the female category, but due to the intensity of the female voice, the results were inaccurate, Taking into account the recording of sounds in places free of noise and noise, and the use of a sensitive and high-quality microphone to capture sounds with high accuracy so that the results are more accurate.

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