Bone fracture detection system

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Abstract: ***There are many cases of bone fracture due to some accidents . Also it might happens with animals too. When this happens a person has to go to X-ray room and then he have to come to doctor which cost more also it is a bit time consuming. So we have developed a portable bone fracture detection which can be handled easily and gives results in no time . Here in this system we have used sound waves to detect the fracture and further those recorded sound waves goes to a software which will compare it and gives you the results. Also our system tells us presence and absence of fracture and not gives us the exact image of it .***

Keywords —portable bone fracture detection system, low cost , MATLAB

I. INTRODUCTION

OUR project aims to give the result in minimum time and it should be cost friendly. We have used sound waves which will detect the fracture .Further we record those sound waves and come it with the help of MATLAB software which will tell us the presence and absence of fracture. As we know doctors arrange some camps in rural areas where proper treatment and equipment's are not available. Our project is portable so it helps them to carry it easily and give them treatment in proper time. Also , it is useful to veterinary doctors. As we know animals can't sit quite for a long time so our system can be helpful to give the treatment to animals in less time.

II. LITERATURE REVIEW

1) Bone Fracture Detection Using Deep Supervised Learning from Radiological Images: A Paradigm Shift.
Research shows that deep learning (DL), a specific subset of artificial intelligence (AI), can detect diseases more accurately than medical practitioners from medical images [1]. Bone Magnetic Resonance Imaging (Bone MRI), X-ray, and Computerized Tomography (CT) are the common key area among DL in medical imaging research. Literature on this domain reflects the high level of interest in developing AI systems in radiology.

2) 3rd National Conference on Emerging Trends In Computer Science & Engineering (NCETCSE-2017)
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Detection of Underground Water using Sound Waves (A SURVEY).
Underground water detection is a social problem; we know underground water is how essential nowadays there is no sufficient technology to detect underground water. PMR and hydro physics one of the best technology to detect underground water. But passing electricity to the earth is not safe also we did not get better performance level. Instead of passing electricity we can pass sound waves the performance level become high comparatively cost becomes low and the implementation gives faster result

III. METHODOLOGY

A. Materials

1) mobile vibrato: it transmits the sound waves through our body
2) stethoscope: helps to receive the sound waves
3) microphone : record the sound waves

B. Make a proper setup:

Joint the equipment's in proper manner . Give power supply to vibrators through a battery .

C. Pseudo Code

Learn about MATLAB:
How to use it . How to do coding

D. Testing:

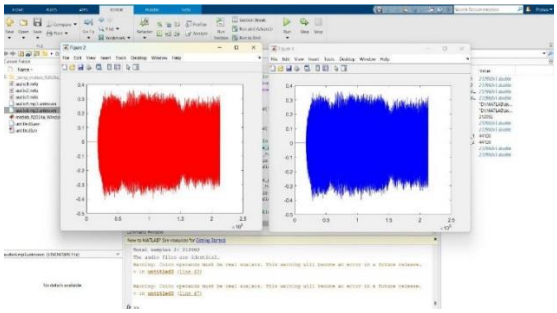
Test the project.
Look whether it is giving proper result or not.

IV. RESULTS AND DISCUSSIONS

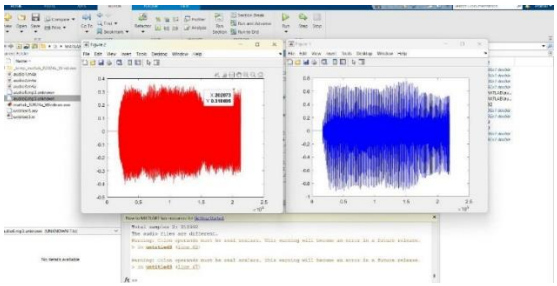
The bone crack detection machine represents a significant leap forward in medical technology, offering a non-invasive and efficient method for detecting bone fractures. Through the precise analysis of bone vibrations and comparison with the frequency signatures of healthy bone, this innovative device reliably identifies the presence and location of fractures. Moreover, its non-invasive nature minimizes patient discomfort and reduces the need for

additional imaging tests, streamlining the diagnostic workflow and improving patient care outcomes. In essence, the bone crack detection machine stands as a testament to the power of technology in advancing healthcare, offering a transformative solution for early fracture detection and improved patient management.

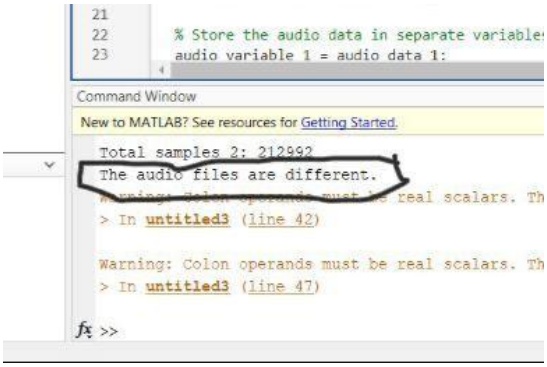
Audio analysis of non fractured bone:



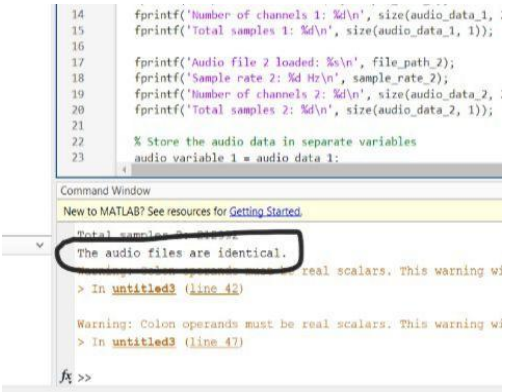
Results of non fractured bone:



Audio analysis of fractured bone:



Result of fractured bone:



V. FUTURE SCOPE

The future scope for the bone crack detection machine is incredibly promising, with opportunities for further enhancement and widespread adoption. Continued research and development efforts could focus on refining the machine's sensitivity and specificity, allowing for even earlier and more accurate detection of bone fractures. Additionally, advancements in machine learning algorithms could enable the device to analyze a broader range of vibration patterns, enhancing its diagnostic capabilities across various bone conditions and patient demographics. Integration with telemedicine platforms could facilitate remote diagnosis and monitoring, extending the reach of this technology to underserved communities and remote areas. Furthermore, collaborations with orthopedic surgeons and medical device manufacturers could lead to the development of portable versions of the machine, enabling point-of-care diagnosis in emergency settings and ambulances. As the field of medical technology continues to evolve, the bone crack detection machine is poised to play a pivotal role in revolutionizing fracture diagnosis and improving patient outcomes on a global scale.

VI. CONCLUSION

A bone fracture technique was designed using sound waves and the results are analyzed on MATLAB software. The output waveforms clearly illustrate the variation in amplitude response and differences between healthy and cracked bones. This device tells us only presence and absence of fractures. The designed portable device can detect cracks or fracture in bones that will be helpful for doctors and people to examine themselves. It will also be helpful for veterinary doctors to examine animals and can also be useful for horse trainers to detect bone fracture quickly hence saving time, health and cost.

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