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SURVEY OF ULTRASONIC DATA COMPRESSION METHODS

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Abstract— In ultrasonic data compression, large amount of data will require in medical and industrial application. The is a successive parameter estimation algorithm with modified version continuous wavelet transform is used to compress and denoise ultrasonic signals.CWT is representation of time × frequency. It will give better result for time of arrival and center frequency. Modified version of CWT is based on Gabor helstrom transform which will exactly estimate both time of arrival and center frequency.MCWT is a reprentation of phase × bandwidth. In Wind plant data compression, are accumulated as interest and investment in renewable energy grows. Algorithm exploit wind speed to wind power relationship as well as temporal and spatial correlations in the data. In low bit rate efficient compression for seismic data, in that large amount of data is available and that will be compressed at higher compression ratio. In data compression and harmonic analysis, Shannon's R(D) theory is used to analysis of harmonics and to remove it.When harmonics will be removed there will be highest data compression ratio is achieved.

Index Terms—about four key words or phrases in alphabetical order, separated by commas.

I. INTRODUCTION

Compression is useful because it helps reduce resource usage, such as data storage space or transmission capacity. Because compressed data must be decompressed to use, this extra processing imposes computational or other costs through decompression. Data compression is subject to a space–time complexity trade-off video may require expensive hardware.Eg.Video to be decompressed fast enough to be viewed as it is being decompressed, and the option to decompress the video in full before watching it may be inconvenient or require additional storage. Compression is used just about everywhere. All the images you get on the web are compressed in the JPEG or GIF formats, several file systems automatically compress files when stored, and the rest of us do it by hand.

II. ULTRASONIC DATA COMPRESSION VIA PARAMETER ESTIMATION

C.Guilherme and S.Jafar states that the, Continuous wavelet transform is used to compress and denoise the ultrasonic signals. In that the Modified CWT (MCWT) based on the Gabor-Helstrom is introduced to exactly estimate both time of arrival and center frequency of ultrasonic echoes.MCWT is a representation of phase × bandwidth. Data compression ratio achieved by successive parameter estimation is (1-5N/J), where J is number of samples and N is number of echoes.

In the signal there are the multiple echoes are present.in another words it is called errors. This echoes will be minimised or estimated by using various parameters.by applying windowing function each eco will be find out.

Parameter used are **α**- is the bandwidth factor, **β**- Is the amplitude. Is a function of the attenuation of the original Signal and the size of the reflector relative to the beam field, **Fc- I**s the centre frequency, **φ**- Is the phase of the signal. Accounts for the distance, impedance, size and orientation of the reflector, **τ**- Is the time of arrival. Its function is related to transducer and reflector by using this function errors will be estimated. Estimation of errors – Errors will be estimated when,

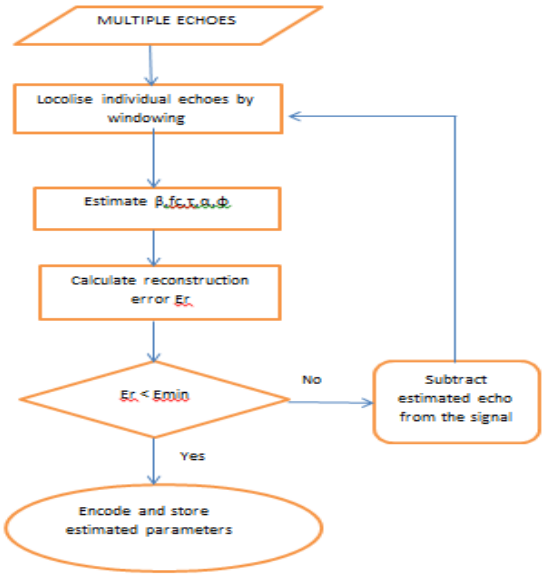

Fig1. Flow chart used for parameter estimation

If Er < Emin, then parameters will encoded and store this estimated paramer.

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If Er > Emin, then the estimated signal will be subtracted from original signal and these procedures will continuous unless and until all echoes will not estimate.The value of Emin is application specific because it varies based on the requirements of the reconstruction quality of the signal. If the error is not acceptable the estimated echoes are subtracted from the original signal and the estimation process is repeated for additional echoes until the error is within the acceptance level fig1 [1].

III. LOSSLESS COMPRESSION OF WIND PLANT DATA

M. Louie and A.Miguel proposed that the, Wind plant data refers to a set containing wind power and wind speed for one or more locations. In that, wind speed at various heights or turbine specific parameters such as rotor RPM, nacelle position and turbine availability may also present. By using dead band and swinging door methods the wind turbine data is compressed. This methods are not lossless they are lossy because of that the exact replication of data will not allow. There is a challenge to acquire the lossless compression of wind plant data.Rsearch and industry community will quickly share the compressed data. In this paper three data sources are considered, synthesized wind resource data from the NREL Eastern and Western data sets and high frequency measured wind turbine data.

The Eastern and Western data sets are created from numerical weather simulation as well as atmospheric data to create the time series of power output. The Eastern data set contains time series of 1326 hypothetical wind plants and the Western data sets contains time series of 32000 hypothetical wind plants. The third set is measured from a wind turbine. Limited sampling window affects the entropy and compressibility of the data. Finally, the wind plant data will compressed by using Eastern, Western and wind turbine data were used as test data sets fig.2 [2].

IV. DATA COMPRESSION AND HARMONIC ANALYSIS

D. Donoho and M.Vetterli states that the, Shannon's R (D) theory is used in harmonic analysis. In Gaussian stationary processes; which says that transforming into a Fourier basis followed by block coding gives an optimal lossy compression technique. Transform based JPEG files can be developed. Wavelet transforms and Gabor transforms which are commonly used in recent Harmonic analysis. In that the commonly Gaussian models are used which uses the transform coding and this is based on Shannon's theory R (D).Shannon's theory states that the maximum rate at which information can be transmitted over a communication channel of a specified bandwidth in the presence of noise [3].

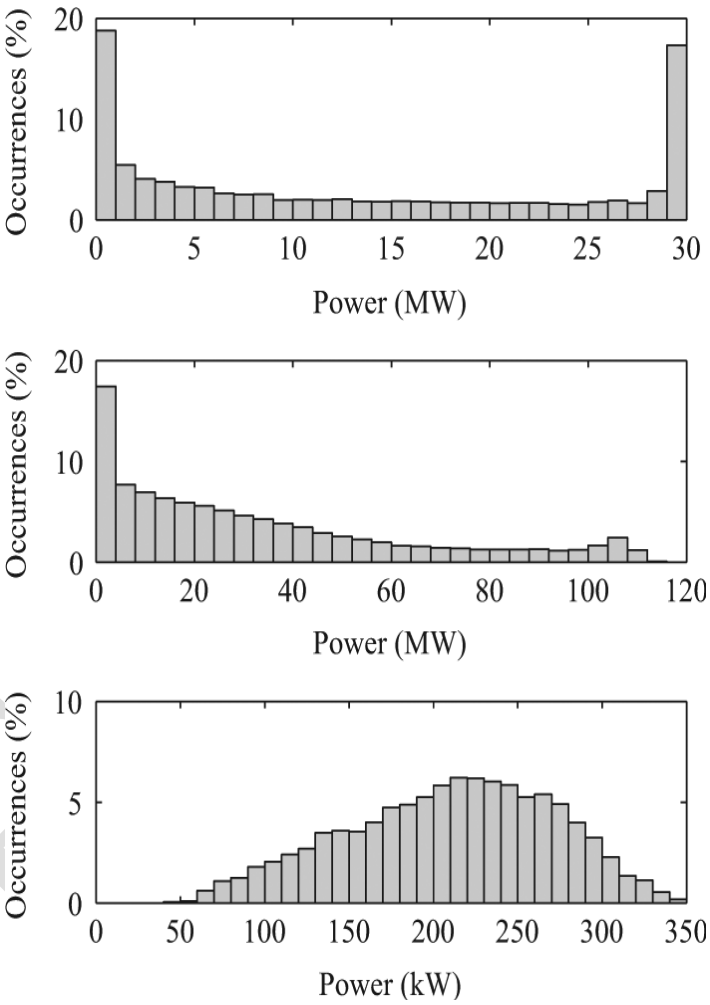

fig.2 Example histograms of individual wind plant locations for wind power from the Western (top) and Eastern (middle) Data Sets and for a single wind turbine (bottom).

V. LOW BIT RATE EFFICIENT COMPRESSION FOR SEISMIC DATA

A.Averbuch, F.Meyer, R.Stromberg, R.Coifman. A.Vassiliou proposed that the, seismic data are available in very large size because of that the relatively new technique used for compression. Marine seismic data sets currently planned with a volume of around 120 Tbytes so that it will need to compress these very large seismic data. Seismic data is not same like that the typical images used in image processing and multimedia application. Data exceeding in the ranges from 100db in theory and the data with have extensive oscillatory nature, x and y represent different physical meaning and significant amount of coherent noise which is often present in seismic data. Algorithm used for seismic data compression is based on some form of wavelet or local cosine transform. In that uniform or quasiuniform quantization scheme are used and finally employ a Huffman coding scheme.by using these compression algorithm we achieve compression result which are acceptable to geophysicists, only at low to moderate

compression ratios. The objective of this method is to achieve higher compression ratios as compare to wavelet/uniform quantization/Huffman coding family of compression schemes. Around the world there 2, 3, and 4 dimensional seismic data (2d 3d 4d) being collected.2d seismic data reprents a single slice of the earth.4d seismic data is the representation of 3d volume at different times in the life of an oil and gas field. Now a days 3d seismic data is a primary choice. Seismic data is collected by sending the sound waves into the ground. For that the energy sources such as vibrators, air guns or dynamite are used [4].

VI. CONCLUSION

Compression will be achieved using various compression techniques. These techniques are different from each other but the aim is to achieve higher compression ratios without loss of data. Ultrasonic data compression via parameter estimation is achieved by using different types of parameter. Lossless compression of wind plant data is compressed by using dead band and swinging door methods the wind turbine data is compressed. Seismic data uses uniform or quasiuniform quantization scheme are used and finally employ a Huffman coding scheme. Harmonic analysis and data compression uses Shannon's theory for compression. By using compression techniques various types of data will be compressed and storage capacity of memory will be increased.

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