VOICE EXCITED LINEAR PREDICTIVE CODING

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ABSTRACT

The act of compressing data in digital audio signals containing speech is known as speech coding. Linear predictive coding is a type of speech coding. The main aim of the project is to develop an improved version of linear predictive coding and use it to code wideband speech signals of 2 males and 2 females. The system must be able to reduce the original bit rate of 128 000 bits per second to 15 450 bits per second. Segmental signal to noise ratio calculations has to be performed on the result. Tradeoffs between bit rate, end-to-end delay and complexity with quality must also be analyzed.

The improved version of linear prediction coding that was developed in this project is voice excited linear predictive coding. I also developed a normal linear predictive coding as a comparison to the improved version. Programming environment that was used to develop both these codes is MATLAB 6.5. The result of this project is the reconstructed speech signal audio played by the software and a plot of the reconstructed speech signal. The quality of the played speech signal is compared between the voice excited and plain LPC coding to determine whether the improved version has a better coding system. The plotted result of both the system is also compared with the original signal's plot to determine the quality of the coding systems. Segmental signal to noise ratio is calculated for the voice excited system and plain system to have a technical assessment of the quality. The bit rate, computational complexity and overall delay of both the developed system are also calculated in this project. The tradeoffs between these quantities with the quality of the reconstructed speech signal are also analyzed in this project.

In overall, this project is successful as the voice excited LPC coding was successfully developed as the improved version of plain linear predictive coding. This system is successful in coding the wideband speech signals of 2 males and 2 females. The quality of the reconstructed speech signal of this system is proven to be better than the plain LPC technique. The segmental SNR calculation and trade off analysis is also successfully performed.