

DTMF DETECTION USING GOERTZEL ALGORITHM

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ABSTRACT

This project is on DTMF Detection using Goertzel Algorithm. It is able to detect DTMF tones from any DTMF source and show the decoded output in a GUI interface. The programming environment of this project design is MATLAB 7.5. Tone generation exhibits how DTMF tones are generated in real time. A GUI for this purpose is designed, where it is a 3X4 keypad matrix, which produces DTMF tone when pressed. The combined sine wave frequency is then plotted in the GUI. For the detection part, the DTMF tone generated from <http://www.dialabc.com/sound/generate/> is decoded using Goertzel Algorithm. Optimized Goertzel Algorithm is used to detect the magnitude of the frequency only. The final output is displayed in the GUI. The results show that all the DTMF tone is decoded successfully.

The design is valid as it is checked with a DTMF detector downloaded from <http://www.zeebar.com/tkddt/> . Validity test is also run on DTMF tones in samples containing noise and voice contamination. The design is accurate for detecting DTMF tones in noisy environment but apparently, need some improvement in detection for voice contaminated sample. As this design is limited to detect DTMF tones from audio source length of 300msec, it can be further improved to detect DTMF tone as short as 5msec. Furthermore, this design can be improved to save audio files in any extension format as this model can only detect tones in .au file. Overall, this project design is successful in meeting its project aim as required by the university: **To build a DTMF detector to detect DTMF tones from any DTMF source using MATLAB.**