

## ABSTRACT

The development of three-dimensional visualization has been used in many applications, such as video games, movies, and video. But development is not supported by the visualization of audio that can make it seem more real visualization.

This final task has successfully created a system to help solving that problem by creating an illusion of circular application of three-dimensional audio. Head-Related Transfer Function is the method used in this final project, which is a method of amplitude and phase modifiers that can be used to create a three-dimensional audio with a circular effect. The measures used in this final task is the pre-processing, calculation of  $x$  matrix length, the HRTF and the conversion process. The parameters analyzed in this final project is MOS and MSE.

Simulation results of this application have managed to convert stereo audio into a three-dimensional audio. Windowing system used in this final project is hamming window. The average time of 46.16 seconds is took by system to convert 2 dimensional audio into 3 dimensional audio. This system also make the most listeners can identify the source of the sound that sounded accurately with maximum 4.53 MOS value. Has been successfully analyzed also with the most appropriate placement of speakers to listen to audio circular 3-dimensional effect with angle  $30^\circ$  of listeners with 2.8 MOS value.

**Keywords:** Conversion, 3D Audio, Audio Processing, HRTF, circular surround sound.