

**Informatics Institute of Technology**  
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**Secure Communication using Near Ultra Sound**

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## Abstract

Short range communication plays a major role in modern day life. From simple file transfers to exchanging credit card information the technology use is on the rise. For all short range communication needs Engineers and Scientists have turned to radio frequency spectrum to solve many issues, and the end result have been introducing many new technologies and new hardware equipment to tackle the ever growing need to be catered. This leads to many problems for consumers as the end users they have to update hand held devices periodically to use the technologies. To overcome the issue and to introduce short range communication technology to the existing handsets and the consumers who are more conservative the idea of the project tries to tackle the idea of secure short range communication with acoustic. The purpose is to address the prevailing problems and to introduce an easy to use, non-expensive solution which does not require specialized hardware. Almost all mobile phones contain a microphone and loudspeaker which means that developers can use acoustic technology to bring communication at short range to a new extent. The research will explore the applicability and understand using of near ultra sound as a medium to communicate between digital devices.

**Keywords:** NFC, Fast Fourier Transform (FFT), Short Time Fourier Transform (STFT), Digital Signal Processing (DSP), Symmetric encryption, Near Ultra Sound (NUS), Elliptic Curve Diffie-Hellman (ECDH), Encode, Decode, Modulate, Demodulate