Detecting Forged Audio

Forgery includes watermarking the copyrights, in audio, it's a repetition of phrases or initial credits, before the main content.

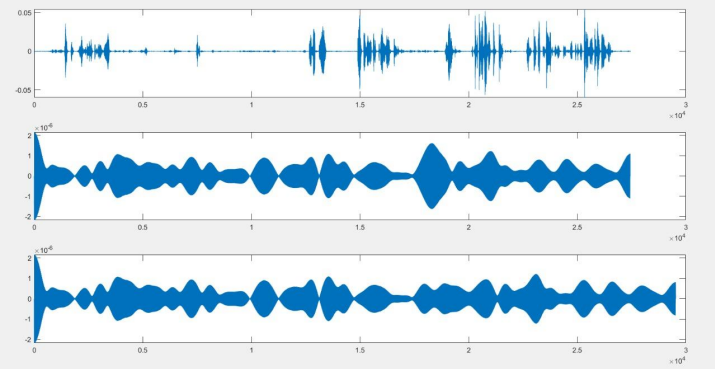
Using different methods on Forged Audio and comparing with original Audio we can detect the Forgery.

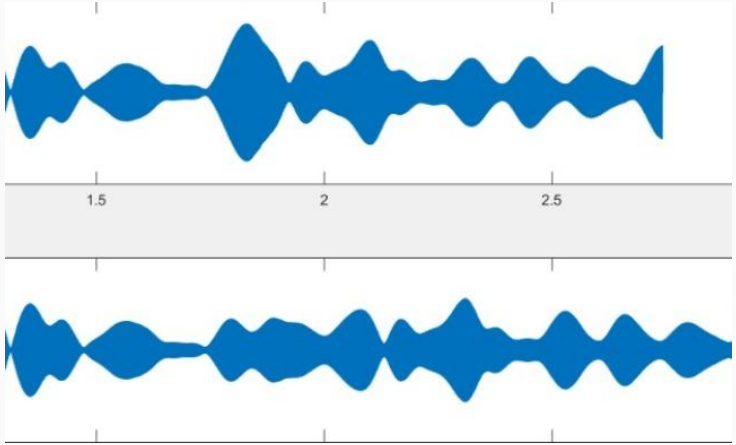
Methods

- ENF frequency comparison
- Phase difference after STFT of ENF signals.
- Long Term Average Spectrum of Signals.

ENF Frequency Comparison

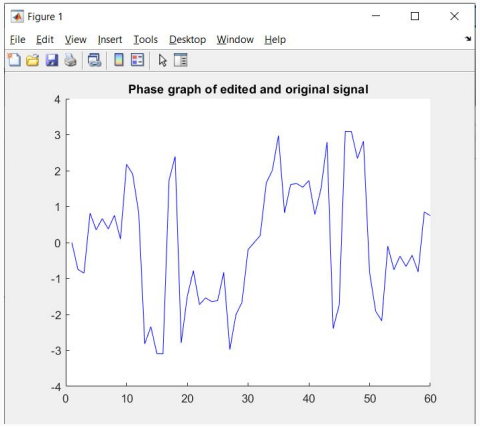
Since every audio recorder works on AC Power, close to 50Hz. ENF is captured in audio signal and can be extracted and compare to ENF's database for authentication analysis.

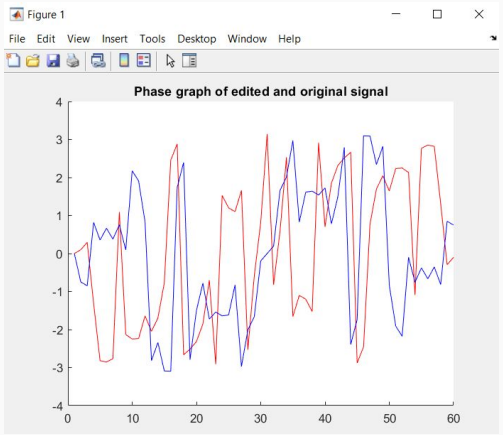




ENF Phase Difference

We were given with original and To be tested Audio file. Using these basic techniques of Signal Processing and phase calculation of signal for ENF Frequency, we can detect if Forgery if there is Phase Inconsistency.





LTAS (Long Term Average Spectrum)

Signal is divided into short time windows, then FFT and power spectral density are computed for each frame and all values are averaged.