

Analysis of Voice Changes in Anti Forensic Activities Case Study: Voice Changer with Telephone Effect

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Abstract

Voice recordings can be changed in various ways, either intentionally or unintentionally, one of which is by using a voice changer. Reference voice recordings and suspect voice recordings will be more difficult to analyze if suspect voice recordings are changed using a voice changer application under certain effects such as telephone effect. Voice Changer can be one form of activity that can be carried out by anti-forensics, making it difficult for investigators to investigate if the voice recording is changed with telephone effect. This study has two types of recordings, namely the reference voice recording (unknown sample) and suspect voice recording (known sample) that has been changed using a voice changer application with telephone effect. Investigations were carried out based on data results extraction and analysis using pitch, formant, and spectrogram using the Analysis of variance (ANOVA) method and the likelihood ratio method. The results of this study indicate that the application of voice changer can be one form of activity that can be carried out by anti-forensics so that it can be difficult for investigators to conduct investigations on sound recording evidence. This research may help forensic communities, especially investigators to conduct investigations on sound recording.

Keywords: voice changer, analysis of variance (ANOVA), likelihood ratio

I. INTRODUCTION

The term anti-forensics becomes the basic term for digital researchers. Although this term is not something new, it does not have a clear set of definitions [1]. Forensics is a specific scientific analysis of anti-forensic behavior as evidence presented in court. Since 2008, sound recordings can be accepted as legal evidence in Indonesian courts [2]. With the existence of multimedia technology to produce sound recordings, evidence is often found in the form of a sound recording tool at the scene of a case where there is a recorded voice of someone's conversation. Different voice recorders found in crime scenes can be compared to determine whether the recording device is from the same person or not [3]. This digital audio recording is a piece of evidence that needs to be verified for authenticity, considering that its use in court proceedings is quite high and continues to increase [4]. Forensic Voice Comparison (FVC) is usually concerned with the comparison of offender recordings with suspect recordings, with the aim of assisting investigative authorities or the court in identifying the identity of a speaker [5]. Records can be presented in criminal and civil cases as evidence. Voice recordings