Spoof Detection for Automatic Speaker Verification

ASEAN IVO 2023

Introduction :

The human voice is one of the biometric indicators representing a person's identity. It has been successfully used in automatic speaker verification (ASV) systems in many applications, e.g., mobile banking and call centers in the financial sector and some access control in the industrial sector. The global growth of the voice biometrics market is projected to expand from 1.1 billion USD in 2020 to 3.9 billion USD by 2026. Among applications using each type of biometrics (e.g., fingerprint, face, iris, palm and vein, and heartbeat), the voice proportion is about 15 percent. It is used primarily in technology and financial domains. At the same time, ASV systems are currently vulnerable to spoofing attacks in which someone disguises themselves as another and illegitimately accesses a secure system. Hence, countermeasures against spoofing attacks are necessary to verify whether the claimed voice is a genuine or fake representation before verifying or identifying the speaker's identity. Attackers might merely replay someone's voice, called replay attacks. Other spoofing attacks, e.g., speech synthesis and voice conversion, can be done easily using tools or advanced technology without prior knowledge. Therefore, this research focuses on spoofing detection in automatic speaker verification.

The objectives of this project are listed as follows: (1) To explore and investigate significant of speech features for spoof detection, (2) To optimize percentage of voice and non-voice segments in features used in spoofing detection, (3) To investigate pathological feature for spoof detection, (4) To minimize detection error, (5) To improve an accuracy of ASV, and (6) To study multi-lingual spoof detection.

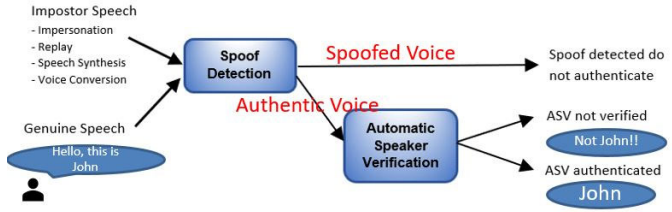

Figure 1. Spoof detection for automatic speaker verification

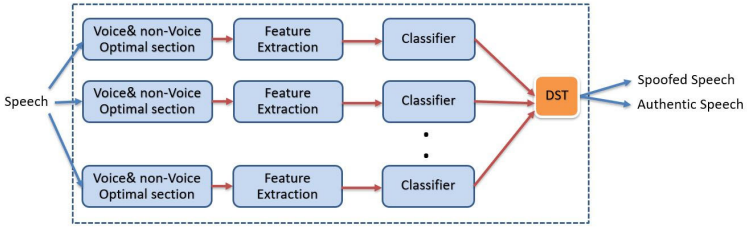

Figure 2. Spoof detection system

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