

Anti-Spoofing Techniques for Voice

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Topics

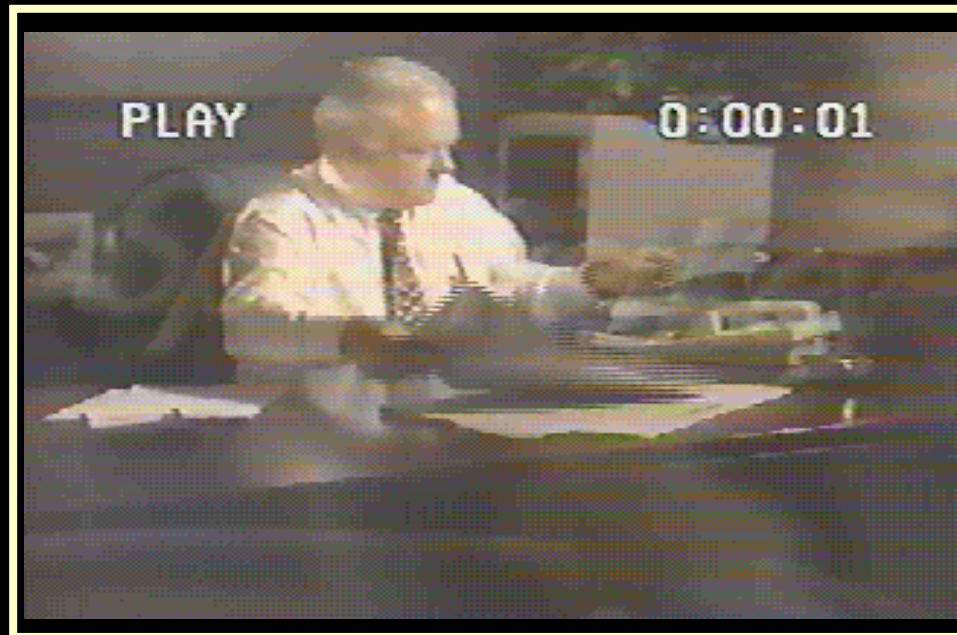
- Kinds of speaker verification
- Kinds of spoofing attacks
- Anti-spoofing techniques

Kinds of Speaker Verification

- Text dependent (fixed-text / password)
- Text prompted (challenge-response)
- Text independent (free text /free speech)

Kinds of Speaker Verification

Text Dependent



Two factors

Kinds of Speaker Verification

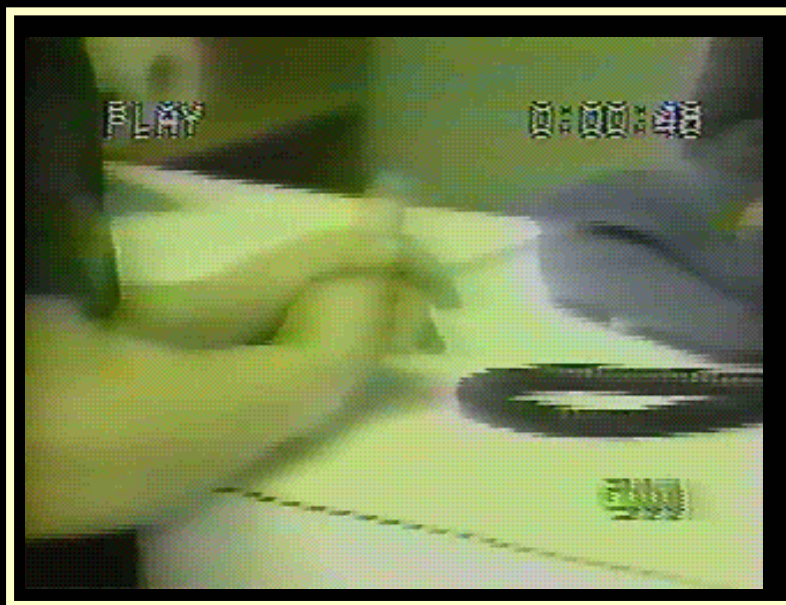
Text Independent



Verify in background

Kinds of Speaker Verification

Text Prompted



Resist replay attack

Kinds of Spoofing Attacks

Today

- **Human impostors**
- **Replay attacks**

Future



- **Text-to-speech synthesis**
- **Voice conversion / Voice mimic**

Noisy channel

Mimics & Human Impostors

The Evil Twin & Other Relatives

- ~~Vocal track analysis~~
- ~~Tight matching~~
- Multi-factor
 - biometric
 - non-biometric



Replay Attacks

- ~~Telltale noise~~
- ~~Exact match~~
- Text prompting
- Multi-factor
 - Biometric
 - Non-biometric



Anti-Spoofing – Multi-Factor

Biometric

- Face (not good for evil twins)
- Lip movement
- Other non-DNA-based biometric

Anti-Spoofing – Multi-Factor

Non-Biometric

- Phone ID
- Knowledge verification
- Other (GPS, e-signature)

Multi-Factor Authentication

2001 A Space Odyssey



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