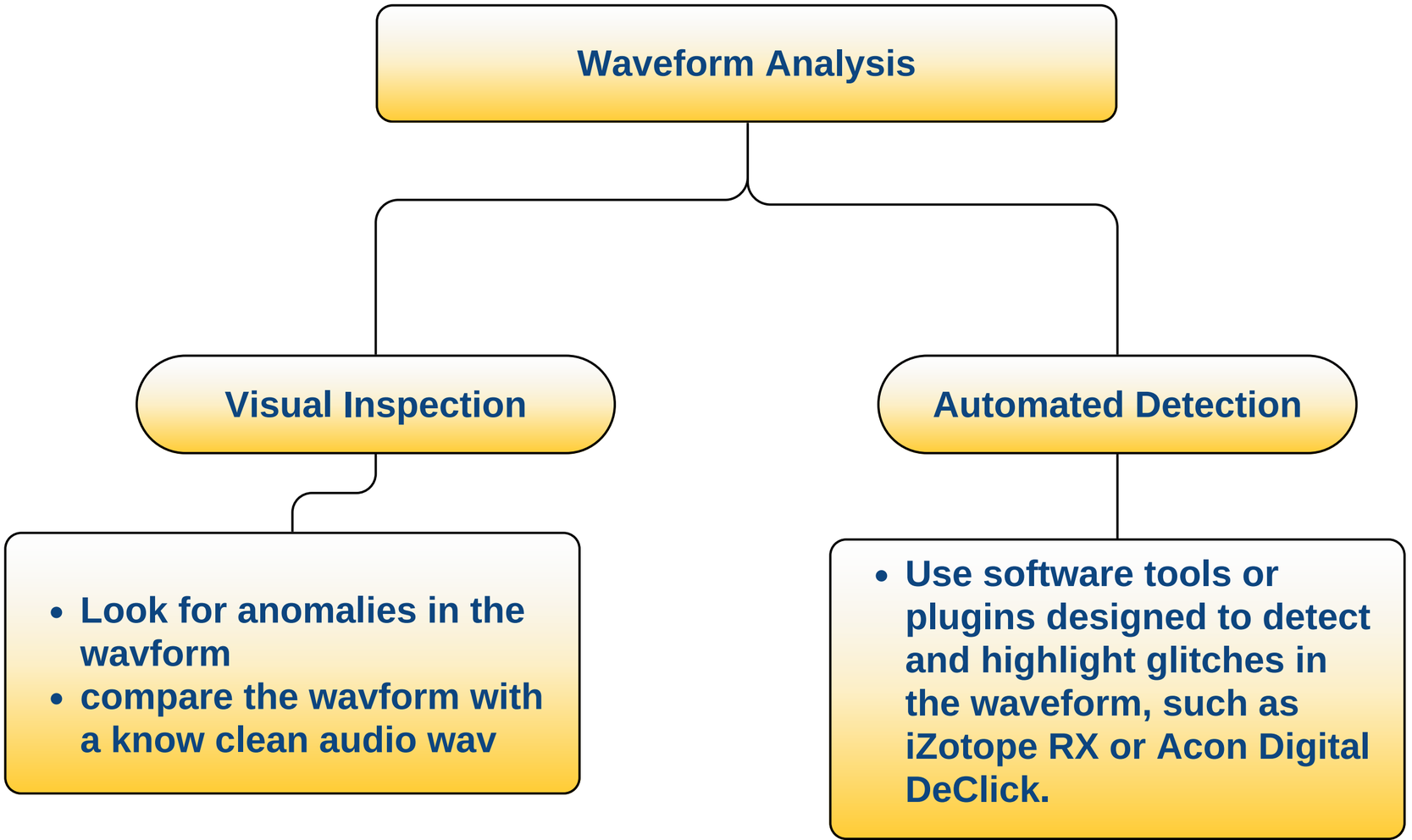
Audio Glitches and Parasites

Audio Glitches	Parasites
• Sudden. • unintended changes in the audio signal. • Caused by errors in recording, processing, or transmission.	• Unwanted noises or interference that persist in the background • caused by electrical interference, grounding issues, or poor shielding.audio signal.

Methods to Detect Parasites and Glitches



Methods to Detect Parasites and Glitches

Spectral Analysis

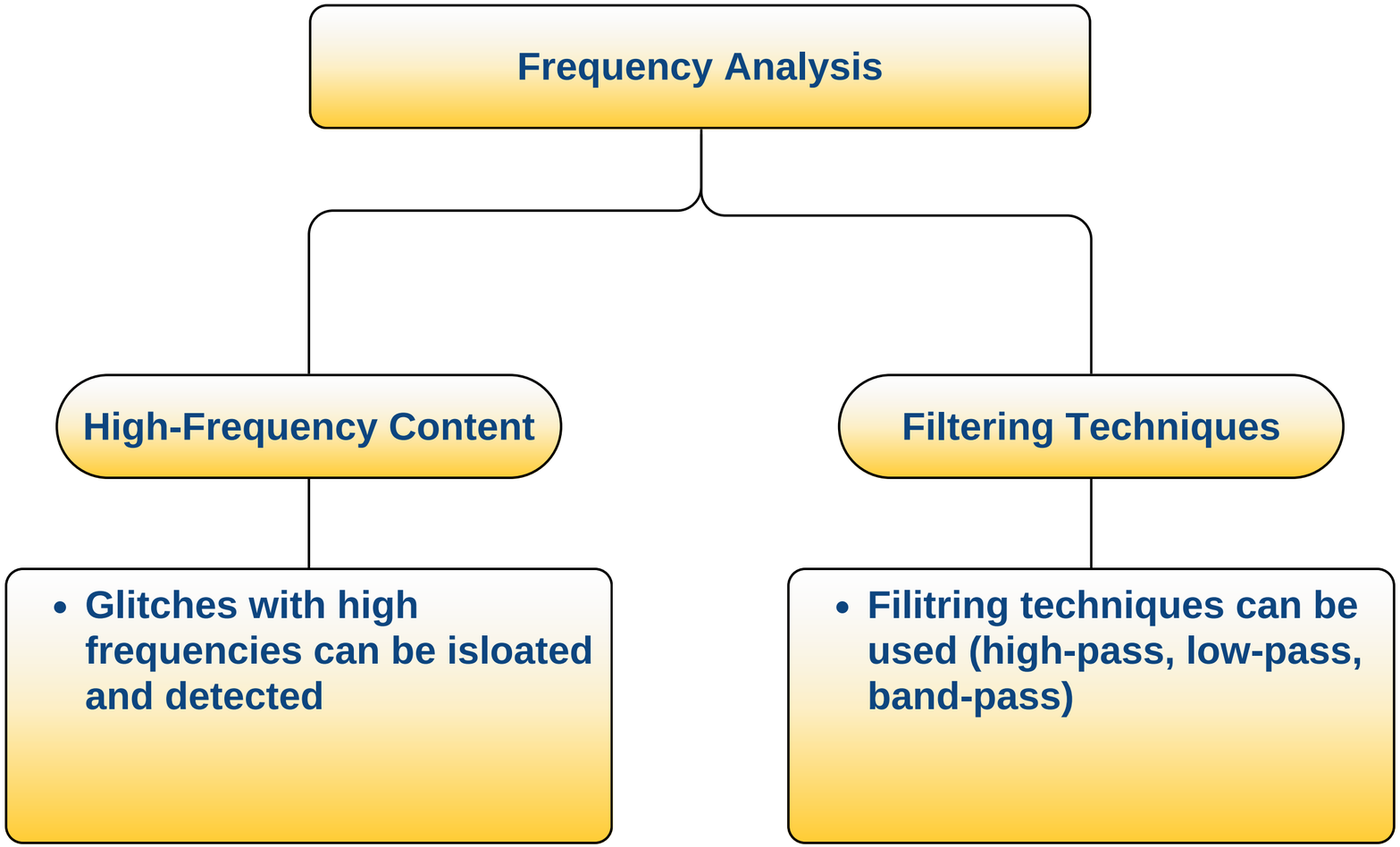
Spectrogram Inspection

- Analyze the audio using a spectrogram, which visualizes the frequency content over time.
- Glitches often appear as short, broadband noise bursts or sudden discontinuities in the spectrogram

Automated Detection

- Use tools like iZotope RX’s Spectral Repair to detect and fix these anomalies.

Methods to Detect Parasites and Glitches



Methods to Detect Parasites and Glitches

Machine Learning-Based Detection

Anomaly Detection Models

- Train machine learning models to detect unusual patterns in audio that may indicate glitches or parasites

Deep Learning Approaches

- Use deep learning models that can learn from labeled datasets of clean and corrupted audio to identify anomalies.

Methods to Detect Parasites and Glitches

Anomaly Detection Models

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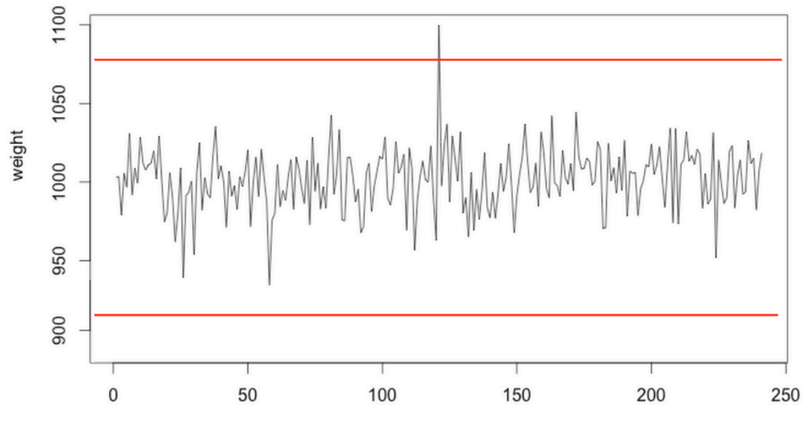
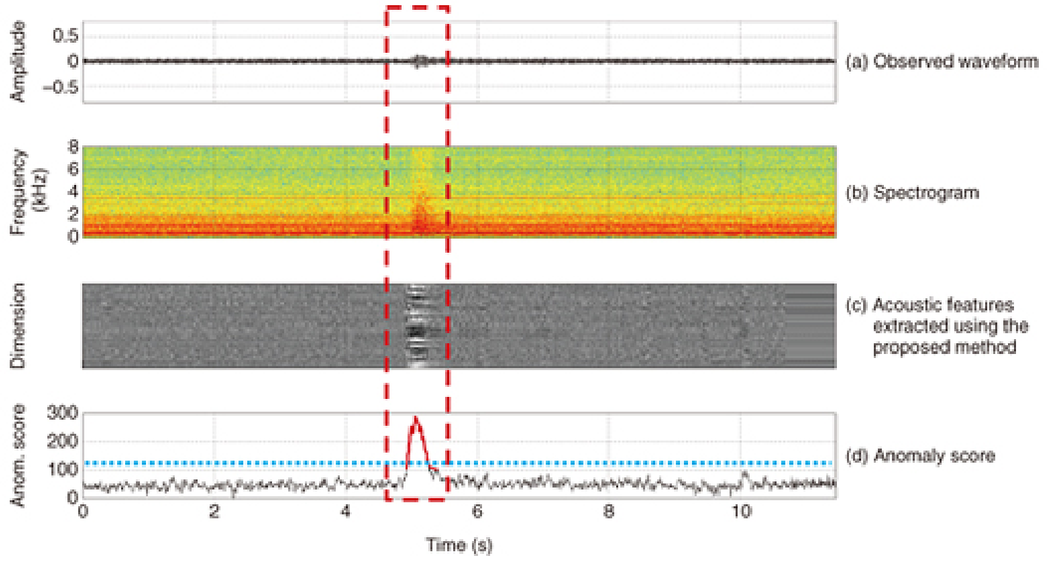
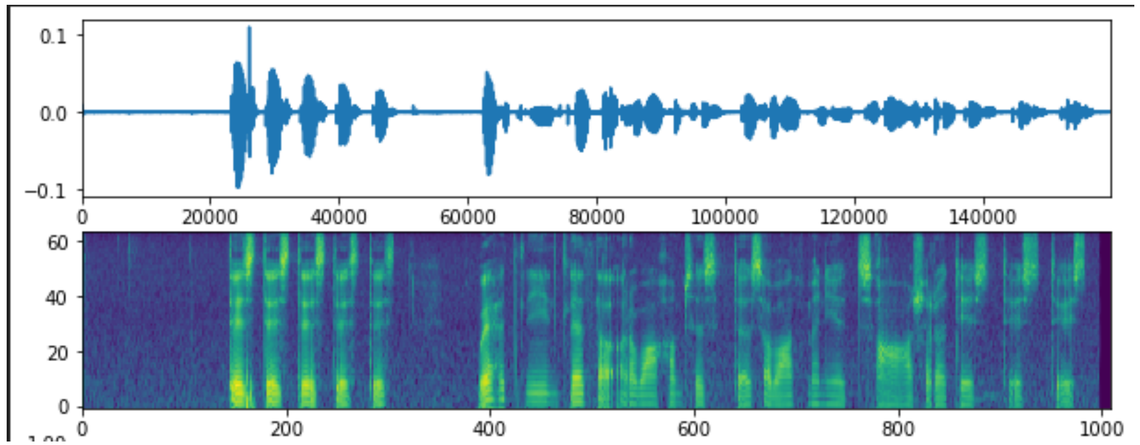
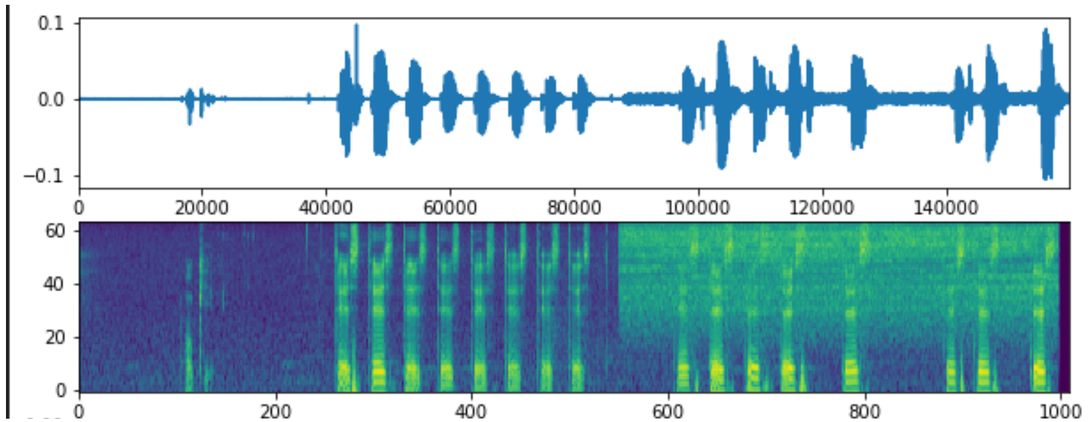




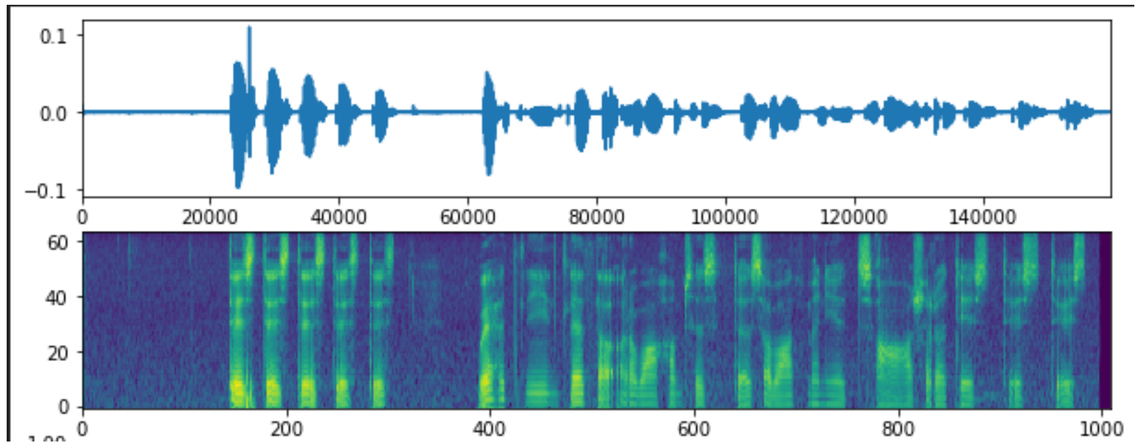
Methods to Detect Parasites and Glitches



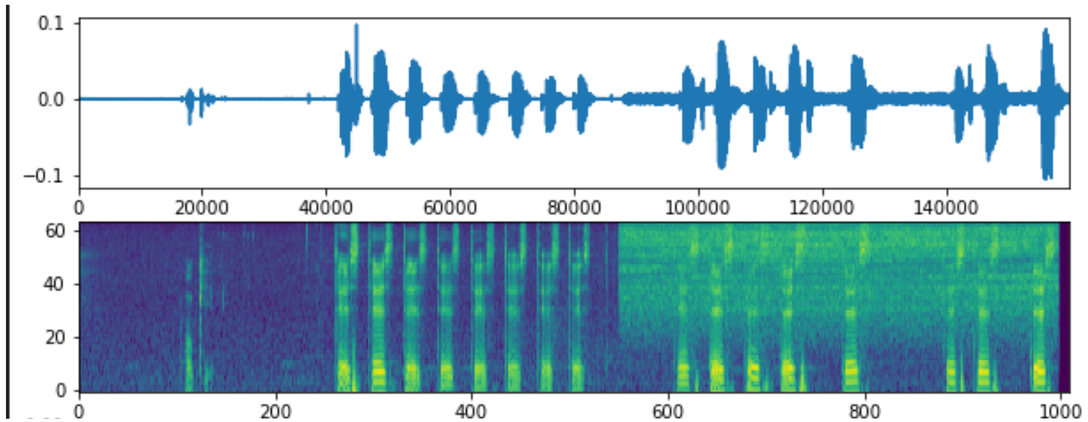


Methods to Detect Parasites and Glitches

Clean



Noised



Qualifying Audio Clip

Metric	Equation	Use case
Signal-to-Noise Ratio (SNR)	$\text{SNR} = 10 \times \log_{10}\left(\frac{\text{Signal Power}}{\text{Noise Power}}\right) \text{ dB}$	Commonly used in telecommunications and recording to ensure clarity.
Peak Signal-to-Noise Ratio (PSNR)	$\text{PSNR} = 10 \times \log_{10}\left(\frac{\text{MAX}^2}{\text{MSE}}\right) \text{ dB}$	
Harmonic-to-Noise Ratio (HNR)	$HNR = 10 \times \log_{10} \frac{\int_w \lvert H(w)\rvert^2}{\int_w \lvert N(w)\rvert^2}$	Commonly used in voice analysis and speech therapy.