

## Appendix 2.2

### Report of International Conference Presentation

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Project Title:	Spoof Detection for Automatic Speaker Verification
Name of International Conference: (Link to website)	27 <sup>th</sup> Conference of the Oriental COCOSDA, 2024 <a href="https://ococosda2024.github.io/">https://ococosda2024.github.io/</a>
Title of Research Paper:	Analysis of Pathological Features for Spoof Detection
Name of all Co-authors (if any)	Prof. Dr. Win Pa Pa, Dr. Aye Mya Hlaing, Dr. Hay Mar Soe Naing, Dr. Kasorn Galajit, Dr. Candy Olivia Mawalim
<p>Comments or feedback received at the conference:</p> <ol style="list-style-type: none"><li>1. The paper presents a valuable contribution to the field of spoof detection by analyzing pathological features in Myanmar deepfake speech. The methodology is robust, and the experimental results offer insightful findings.</li><li>2. This paper focuses on the detection of deepfake speech using pathological features within the Myanmar Spoof Dataset, which is highly relevant to the O-COCOSDA community. The study addresses key concerns in automatic speaker verification (ASV), speech synthesis detection, and the application of acoustic analysis techniques. The topic is well-aligned with the conference's focus on speech processing, speaker verification, and ensuring the integrity of speech systems in multilingual contexts.</li></ol>	
<p>Contribution to the project:</p> <p>Analyze key feature variations and uncover meaningful distinctions among various spoofing methods, enhancing the effectiveness of speaker verification with the newly developed UCSYSpoof dataset for the Myanmar language.</p> <p>This conference covers the scope of -</p> <p>Audio, Speech and Language Processing</p> <p>Datasets, Benchmark Systems, Models and Shared Tasks</p> <p>Multimedia, Biomedical and Health Informatics</p> <p>Information Forensics and Security</p>	

Photos





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## Analysis of Pathological Features for Spoof Detection

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### Abstract

Deepfake speech presents significant challenges due to realistic sound and detection complexities.

Effective feature selection and analysis are vital for improving spoof detection.

This study focuses on analyzing pathological features within the Myanmar Spoof Dataset. Spoofed speech in the dataset is created using five distinct techniques:

1. HiFiGAN (vocoder method)
2. Parallel WaveGAN (vocoder method)
3. FreeVC (pre-trained voice conversion)
4. GMM-based
5. Differential GMM-based voice conversion (GMMVC\_DIFF)

### UCSYSpooof Dataset

Comprises five distinct subsets designed for spoofing detection in ASV tasks and contains both genuine and spoofed speech samples.

The spoofed portion, consisting of 63,932 audios, is generated using five sophisticated techniques.

Summary of each technique used in the UCSYSpooof dataset is provided in Table I.

Table I. Detailed Statistic of UCSYSpooof Dataset

Label	Dataset Type	No. of Audios
Genuine	Genuine dataset	12,000
	HiFiGAN	11,966
	Parallel WaveGAN	11,966
Spoofed	FreeVC	24,000
	GMM VC dataset	8,000
	GMM DIFFVC dataset	8,000

### Methods and Materials

#### Features analysis



The flowchart shows 'Speech' input branching into 'HiFiGAN', 'Parallel WaveGAN', 'FreeVC', 'GMMVC', and 'Diff'. These lead to 'Pathological Features' which are then analyzed using 'BSSR' (1. Ideal, 2. Ideal Absolute, 3. mag, 4. spec, 5. dbb, 6. int) and 'Spectrum' (1. Ideal, 2. IdealB, 3. spec, 4. spec1, 5. spec2, 6. dbb, 7. int). The final output is 'Features Results'.

**Control Peak Parameters (CPP)**

1. Noise Detection  
2. No Voice Detection

Figure 1. System Design for Comparing Datasets and Features







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### **[Required Documents]**

- A) Presentation Materials (e.g. PPT slides)
- B) Final Program of the conference

A handwritten signature in blue ink, appearing to be "Myat Aye Aye Aung", is located to the right of the list of required documents.

**Reporter: Myat Aye Aye Aung**

**Date: 22/10/2024**