

Chapter 3

High SNR
recordings

Goal

1. Review previous work
2. Develop a novel feature set to improve current classification performance

Outcome

1. Proposed fused feature set can achieve a better classification performance compared with most previous studies.
2. Cepstral features are effective for classifying frog calls, but very sensitive to the background noise

Motivation

Design a novel cepstral feature with both good classification performance and excellent **anti-noise ability**?

Goal

Use wavelet packet decomposition to design a novel feature

Outcome

1. Wavelet-based cepstral features are effective for classifying frog calls, and robust to background noise
2. These features can be used for both low SNR and high recordings

Motivation

So far almost all recordings used have a high SNR. Low SNR recordings have **multiple simultaneously vocalising frog species**, how to design a suitable classification framework?

Goal

Use multiple-instance multiple-label (MIML) learning to classify frog calls in low SNR recordings

Outcome

MIML learning can effectively classify frog calls in low SNR recordings. However, the classification performance is highly effected by the event detection results

Motivation

To improve the classification performance, we can (1) use supervised learning to perform event detection. But we do not have much annotated acoustic data, (2) **use multiple-label learning.**

Goal

Use multiple-label (ML) learning to classify frog calls

Outcome

ML learning can improve the classification performance of MIML learning without the segmentation process

Chapter 6

Low SNR
recordings