

Chapter 3

Trophy 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 to 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 an 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 trophy and field recordings

Motivation

Trophy recordings have a high SNR and one frog specie per recording.
Field recordings have **multiple simultaneously vocalising frog species**. How to design a suitable classification framework?

Chapter 5

Trophy recordings

Goal

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

Outcome

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

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

Trophy recordings