Overview

Apply semi-supervised method to audio tagging/retrieval.

Utilize untagged samples and reduce the needed number of expensive tagged samples.

Technical Challenges: Use Inexpensive Untagged Audios

Audio samples having high-quality tags are very expensive!

Semi-supervised method utilizes inexpensive untagged audio samples!

Easy to collect at low cost!

Technical Challenges: Use Tag Co-occurrence Information

Tag co-occurrence information seems to be useful for tagging/retrieval task. But almost all of existing method cannot utilize this information.

Typical approach

- Train a dedicated classifier for each tag separately.
- Linear regression [Whittaker- 2006]
- Hierarchical ODM [Tsumura- 2006]

Drawback:

- Difficult to use co-occurrence information of the tags.

Typical approach

- Design probabilistic generative model for audio signals and tags.
- MPM [Helmholtz-1860] [Price-1999]
- LDA- MPM [Price-2000, image LDA-2005]

Topic model based approach

- Estimate this

2. Propagate tag information: Multi-label SSDE

Multi-label version of semi-supervised kernel density estimation. (SSDE [Wang et al. 2009])