Overview audio fingerprinting algorithms and its application in SoundHound

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Project topic:

When we listen to music, we often have the question: “What is the name of the song that I just heard?” Before audio fingerprinting was invented, this question could hardly be answered, since it is hard to analyze the sample that audience offered, which might be a melody fragment, or just an inaccurate humming. However, we could use audio fingerprinting systems to analyse small chips of music recordings and search a reference database for recordings that contain the same musical features. These systems can find matching recordings even when the query has been recorded in a public space and contains added noise. For example, SoundHound - as a representative of music recognition application, it has its own database to store all the melody and rhythm with the millions of user recordings (including the humming samples) to ensure assist users get the fastest, and the most accurate result. In this project, we will focus on the following research questions:

1. How does audio fingerprinting algorithms work to identify short music recordings?
2. What is the popular fingerprinting algorithms and how is performance? What factors should be considered when we want to evaluate fingerprinting algorithms (e.g response time, accuracy, etc.) ?
3. How does SoundHound/Shazam work? How fingerprinting algorithm is used in this app?
4. What is the flaw of current fingerpringting algorithm used in Shazam ? Under what situation the algorithm is most likely to fail (boundary case)? (For CSC561)

Project Schedule:

Week	Task
May 21 - May 27	Information preparing and finishing Proposal: Define the research question, make plan for the project delivery and get the proposal ready to submit
May 28 - June 3	Information gathering: 1. Improve the research question to a more detailed level 2. Gather information from former studies. 3. Team meeting will be held at the end of this week and tasks will be assigned to team members.
June 4 - June 10	Information gathering: Each team member works on the assigned task by themselves. Team meeting will be held at the end of this week as a review session.
June 11 - June 17	Preparing for Interim Report: Each team member will contribute on the assigned part.
June 18 - June 24	Preparing for Final Report: Team member will work together to write the final report (for content update).
June 25 - June 29	Preparing for Final Report: Team member will work together to finish the final report.

4. Website URL:

https://github.com/YiYiWu/Polka-Dot.git