V2V: A Second Variation on Query-by-Humming

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1. Introduction

Music information retrieval (MIR) systems tend to fall into two camps: that camp developing cataloging and providing advanced access systems for large collections of music and that camp developing specific query or access mechanisms. By and large, the former camp concentrates its efforts on developing large collections and integrating with existing library systems, while the latter experiments with relatively small collections that are stand alone.

We have started to merge these camps by integrating Variations2, which provides access to a digitized portion of Indiana University's vast music library, with Michigan's VocalSearch [1], which provides a query-by-humming (QBH) search engine. The joint system, V2V, demonstrates how QBH can be used in connection with a large number of holdings in a real-world environment.

2. System architecture

The Variations2 digital music library system combines a music-specific bibliographic search facility based on a unique metadata model [2] with a variety of tools for working with music content in its various formats. Version 2.0 of Variations2 adds support for synchronized sound and score playback as well as a Timeliner tool that can be used by music students and instructors to create form diagrams of musical works in combination with audio.

The VocalSearch program works as follows: A user sings a query, assumed to be a theme, into the audio-recording software of the computer. VocalSearch processes the audio query by converting it to an internal format, matching it against a database of musical themes, and then constructing a song list, ranked by similarity. Next, VocalSearch writes the song list to an XML file.

In V2V, VocalSearch sends the XML file to the Variations2 client application (running on the same machine as VocalSearch) for processing. The user is then able to access Variations2 content related to each theme the query matched, taking advantage of the various tools provided, including sound-score synchronization and the Timeliner.

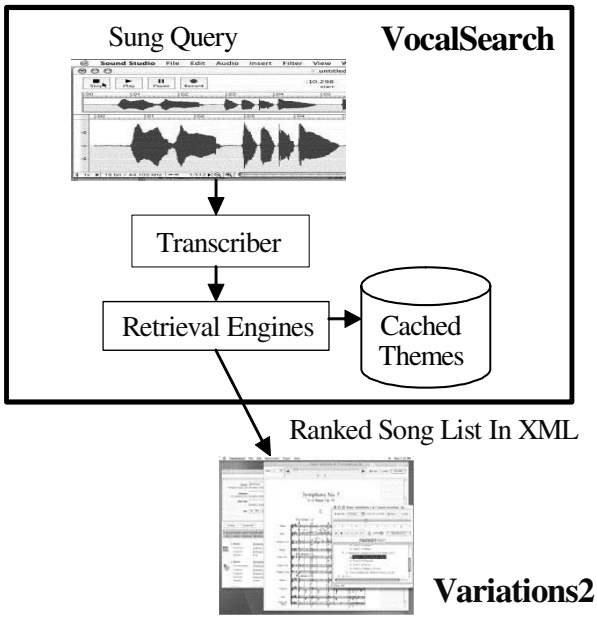

Figure 1. VocalSearch integrated with Variations2

3. Acknowledgments

This work is supported by the National Science Foundation grants IIS-9909068 and IIS-0085945. Any opinions, findings, and conclusions or recommendations expressed here are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

4. References

[1] W. Birmingham, B. Pardo, C. Meek, and J. Shifrin, "The MusArt Music-Retrieval System: An Overview", *D-Lib Magazine*, February 2002. http://www.dlib.org/

[2] N. Minibayeva and J.W. Dunn. "A Digital Library Data Model for Music", In *Proceedings of the Second ACM/IEEE-CS Joint Conference on Digital Libraries*, Portland, Oregon, 2002, pp. 154-155.