

# Bridging Music Information Retrieval and Folk Song Research

## The Computational Setup of the WITCHCRAFT Project

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### Abstract

The WITCHCRAFT project sets as its objective to develop a fully functional content-based retrieval system for folk song melodies to be integrated in the Nederlandse Liederbank<sup>1</sup> (Dutch Song Database, Figure 1). We support the research in folk songs by designing and implementing a number of workflows and data processing pipelines. Therefore a number of tools have been adapted or newly developed for data entry, data processing, algorithm testing and result presentation. In this demo we present our computational setup and explain which difficulties we encountered.

Folk songs are encoded using the *WitchCraftEditor* (Figure 2), a *Lilypond*<sup>2</sup> front-end. The musical encodings are checked for consistency and translated into different formats such as *Humdrum*<sup>3</sup> **\*\*kern**<sup>4</sup>, MIDI, PDF and JPEG. From these different views are systematically derived using the iterative application of *Makefiles*.

For an enriched *ground truth*, manual comparisons of the tunes are done by experts and the results are encoded with the *MelodyNormAnnotator* (Figure 3). This ground truth is good for testing specific types of musical similarity (i.e. contour or rhythm) and for training and testing alignment related algorithms. Visualizations of manual and algorithmically made alignments can be made using different tools (Figure 4). These are useful for studying which aspects are stable in different variants of folk songs.

Together with tools for automatically measuring the performance of retrieval algorithms, this leads to more and more refined musical similarity algorithms. Different such methods can be chosen by researchers and end users for searching the Liederbank.

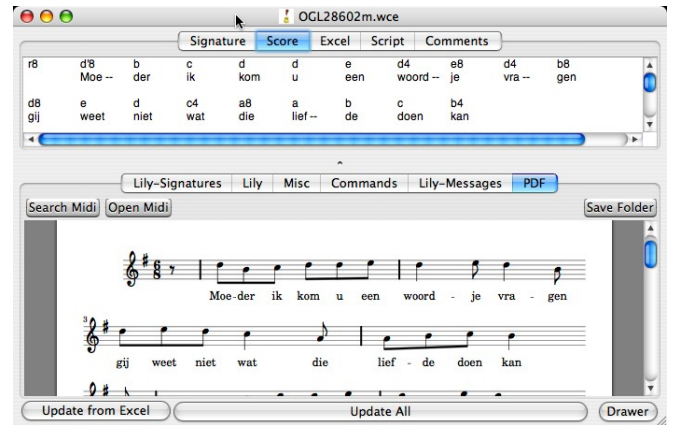


Figure 2: The WitchCraftEditor for folk song encodings

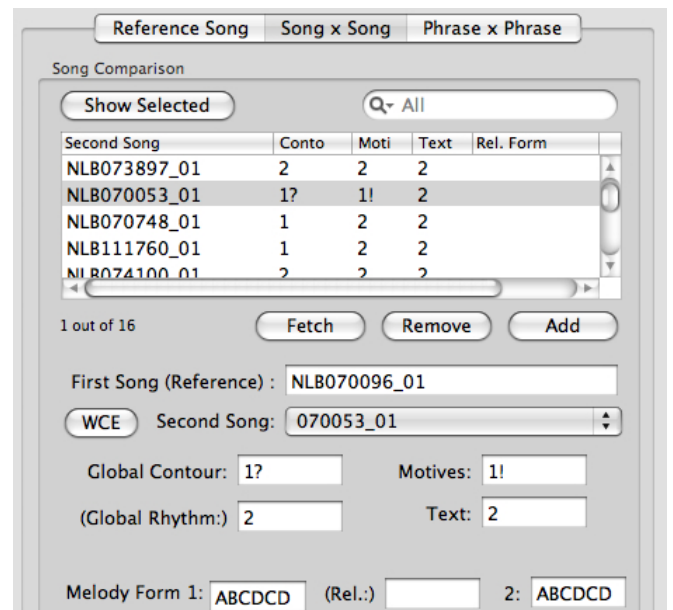


Figure 3: The MelodyNormAnnotator for song comparisons



Figure 1: The Liederbank web interface

<sup>1</sup><http://www.liederbank.nl/index.php?wc=true>  
<sup>2</sup><http://lilypond.org>  
<sup>3</sup><http://www.musiccog.ohio-state.edu/Humdrum/>  
<sup>4</sup><http://kern.humdrum.net>



Figure 4: Alignment summarization using Humdrum tools