

Master project abstracts in collaboration with Doremir

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Area 1: Music learning applications (in collaboration with DoReMIR and KMH)

Develop interfaces for different aspects of learning music practice/musical elements using DoReMIR technology. For these projects, musical expertise comes from DoReMIR and KMH, whereas the KTH Master student needs some skills in the design and evaluation of interfaces, and a basic understanding of signal processing. The outcomes of all projects will be directly relevant for the development at the DoReMIR company.

Project 1: Learn to sing in tune

How can you use digital technology to learn how to sing-in-tune? For many people singing with good intonation is a great obstacle and it is a goal for music education on all levels, to teach students to being able to improve their intonation skills. What is good intonation is a non-trivial question which is also true for methods of improving your skills. You will develop an application together with DoReMIR and a master student from KMH.

Project 2: Learning timing

Timing is a fundamental musical skill and an important means of musical expression with many facets, such as relating to a pulse and the interpretation of rhythms. Yet, most software applications are devoted to mechanical reproduction of rhythms. Can we develop an application that helps developing an expressive relationship to timing? In this project software development from DoReMIR will serve as a basis to develop a game-like environment for practicing rhythm in different musical contexts, guided by musical expertise from KMH.

Project 3: Learn harmony

To understand and learn harmony in music is highly complex. How can a digital software application assist in developing harmony skills? The project will be focused on the Jazz

music. It will start with a literature overview of e-learning tools for this music, and discussions with teachers at KMH about how harmony is taught. Based on these insights a game-like environment will be developed that asks users to e.g. play chords a melody played by an instrument, and the applied chords will be assessed by the software. The challenges are to develop such an interface, and to find ways to assess the quality of the played chords.

Area 2: Music Information Retrieval (in collaboration with DoReMIR)

Develop interfaces and improve algorithms for different aspects of DoReMIR technology. For these projects, musical expertise comes from DoReMIR, whereas the KTH Master student needs some skills in the design and evaluation of interfaces, and a basic understanding of machine learning approaches. The outcomes of all projects will be directly relevant for the development at the DoReMIR company.

Project 4: Instrument classification in polyphonic music

The automatic recognition of an instrument from a monophonic audio recording is one very common problem in music information retrieval. Recently, a prototype based on state-of-the-art machine learning was implemented at DoReMIR. The goal of this project is to extend the ability of this approach to the recognition of which instruments are playing together in a recording that contains several instruments. This classifier will be based on common models for instrument classification in musicology. You should have some basic understanding of machine learning approaches, and you will develop a classifier that will be evaluated within the framework of the DoReMIR music platform.

Project 5: Music Transcription

Automatic music transcription is one of the key functionalities of the DoReMIR software. Goal is to determine automatically the played notes from an audio music recordings. The current system works very well and incorporates a state-of-the-art approach. This project shall extend the capabilities of the automatic transcription in one important aspect: depending on the user, varying amount of detail may be desired in the transcription. In some places, the user may want to see only a summary of the tunes with the most basic notes, in other places the user may want to see the melody with all detail of ornamentation and articulation. Interfaces towards the control of such detail shall be developed and evaluated. You will learn how to interface with the state-of-the-art algorithm, providing with important insights into how automatic transcription works.