

Poster: Digital Edition and Harmonic Analysis Tool of Bruckner's Studybook

After two years of working on the digital edition of Anton Bruckner's Kitzler-Studybook and creating a tool for automatic harmonic analysis, our working group likes to present the results of the project.

The foundation of the undertaking is a 326-page manuscript, which documents Bruckner's compositional training by the capellmeister and conductor Otto Kitzler in Linz. It contains exercises on modulation and harmony and studies of musical genres like *étude*, waltz, and Lied as well as larger works such as string quartet and symphony. Bruckner's studies also involved modifications of the musical content as the composer found different solutions for the same harmonic problem. As he was never concerned about publishing any of these exercises, Bruckner frequently erased material, sometimes beyond recognition, to add new ideas. Furthermore, as Bruckner and his teacher were frequently discussing the exercises, many textual annotations found in the margins and between the staves give an insight into Kitzler's teaching methods and Bruckner's execution. This remarkable manuscript and the assortment of works in different length and type provide an ideal setting for an enriched digital display and the development and testing of the analysis tool.

The digital edition of the Kitzler-Studybook offers two different views. The chronology of the manuscript pages forms the basis for the first one, the source-view. It comprises MEI transcriptions of the musical text displayed via *Verovio*, high-resolution images of the facsimile in the *OpenSeadragon* image viewer and rudimentary audio-playback using a MIDI player. The users can toggle between added and deleted content as well as view transcriptions of the comments by Bruckner and Kitzler. The second view concentrates on complete works of the Studybook. The erased musical content is left out and only the "finished" composition remains.

In the work view, users can produce automatic harmonic analysis information, based on key analysis using the Krumhansl-Schmuckler algorithm. After counting every note in segments, whose size is pre-defined by the user, the algorithm compares the result with reference values for all keys. The highest correlation value indicates the key with the highest probability of being the one for the segment. Bars below the staves, each representing a different key in a different colour, illustrate the resulting data. Each chord on each timestamp is labelled with its chord name and Roman numeral. This is achieved by determining the interval pattern (relative to the key root) of simultaneously sounding notes and matching these patterns with pre-defined templates for basic chord structures. These interval structures are stored in templates and used to mark basic chord patterns in the viewer. The result of the analysis is inserted into the encoding, augmenting it for further research.

Bibliography

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