abtab – a toolbox for computational processing and analysis of music in lute tablature

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1 AbsoLutely Tabulous (abtab)

AbsoLutely Tabulous (abtab) [1] is a toolbox for computational processing and analysis of music in lute tablature, written in Java, Python, and Bash. A prototype is developed within the E-LAUTE project [2]. abtab is extensible and multi-modular, builds on existing tools and research, and is designed as a portable command-line tool that runs on Windows and Unix-based OS.

2 Foundation

Individual modules are built on previous research into

- **Voice separation**: the extraction of polyphonic voices from unstructured symbolic music representations [3, 4].
- **Intabulation practice**: the arrangement of vocal models for polyphonic solo instruments [5].
- **Toolbox building** [6].

3 Modules

Currently, abtab contains four modules (tools):

- converter. Converts between formats; built on luteconv [7].
- transcriber. Produces transcriptions into various forms of CMN; built on machine learning models for voice separation [3, 4].
- tabmapper. Aligns intabulations and their vocal models [5].
- analyser. Enables further (musical and statistical) analysis and visualisation of input and output files (**under construction!**).

4 Future work

The toolbox is in full development. Future work includes

- Expanding the existing modules and adding new ones.
- Building a web service hosted by E-LAUTE that integrates abtab within the E-LAUTE web environment.
- Exploring how abtab can assist current research into tablature corpora.

5 References

[1] github.com/reinierdevalk/abtab/

[2] e-laute.info/

[3] R. de Valk, T. Weyde (2018). Deep neural networks with voice entry estimation heuristics for voice separation in symbolic music representations. In *ISMIR* (pp. 281–288).

[4] R. de Valk, T. Weyde (2015). Bringing 'Musicque into the tableture': Machine-learning models for polyphonic transcription of 16th-century lute tablature. *Early Music*, *43*(4), 563–576.

[5] R. de Valk, R. Ahmed, T. Crawford (2019). JosquInTab: A dataset for content-based computational analysis of music in lute tablature. In *ISMIR* (pp. 431–438).

[6] R. Ahmed, R. de Valk, T. Crawford (2019). A digital toolbox for tablature. *MedRen*.

[7] bitbucket.org/bayleaf/luteconv/src/master/

[8] mei-friend.mdw.ac.at/

[9] verovio.org/

6 Example workflow

Scenario: a piece in lute tablature needs further investigation. Only (a facsimile of) the original source is available.

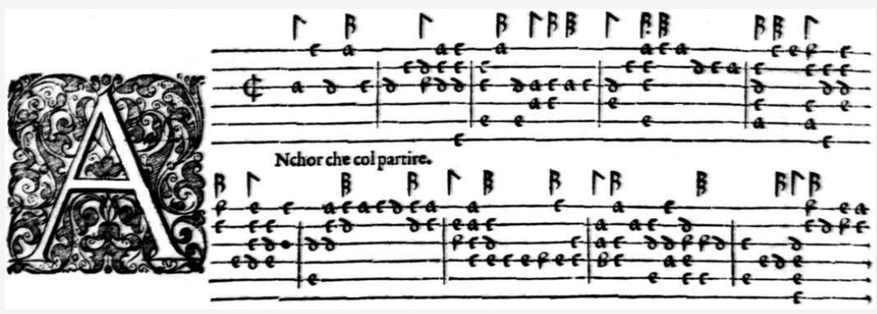
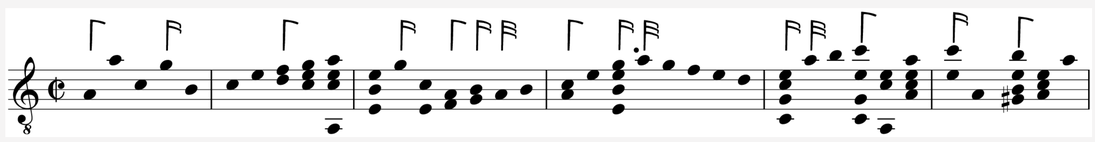


Figure 1. Emanuel Adriaenssen, Anchor que col partire. *Pratum musicum* (1584), f. 7v.

Step 0. Create (or find) an encoding of the piece in one of the formats that the abtab tools can read. Encodings in other formats can be converted with converter.

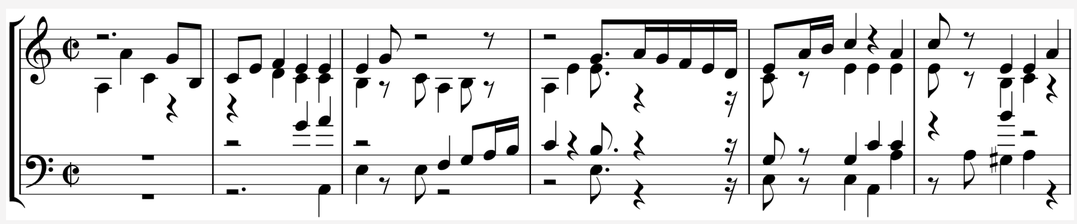
Step 1. Create a *diplomatic* transcription with transcriber; render the resulting MEI file with mei-friend [8] and Verovio [9].

```
$ abtab transcriber -d y -k 0 -t n -f anchor.xml
```



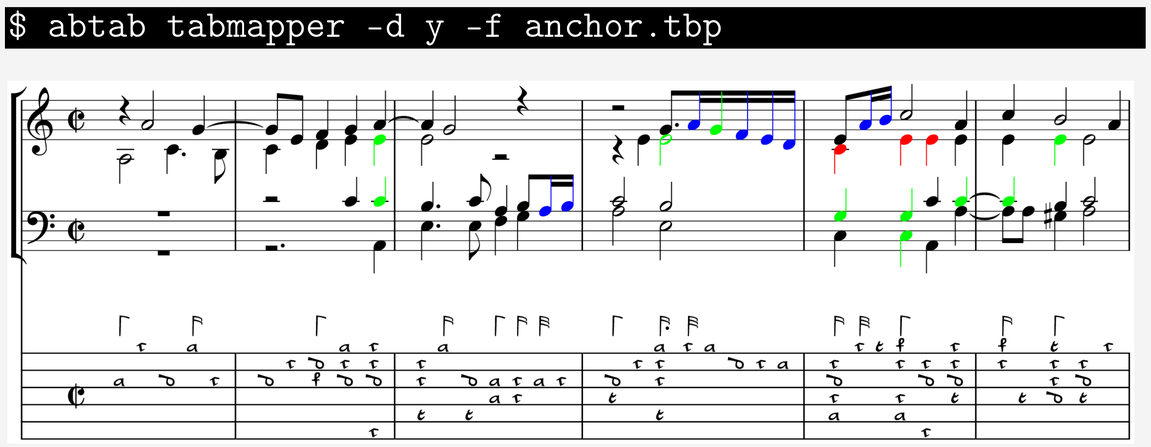
Step 2. Create a *polyphonic* transcription with transcriber; render the resulting MEI file with mei-friend and Verovio.

```
$ abtab transcriber -k 0 -t n -f anchor.tbp
```



Step 3. Align the intabulation and vocal model with tabmapper; render the resulting MEI file with mei-friend and Verovio.

```
$ abtab tabmapper -d y -f anchor.tbp
```



Step 4. Analyse.

```
$ abtab analyser ...
```