When you **convert a music file** between two formats, you may be **losing information** that you did not anticipate to lose

The effects of translation between symbolic music formats: *A case study with Humdrum, Lilypond, MEI, and MusicXML*

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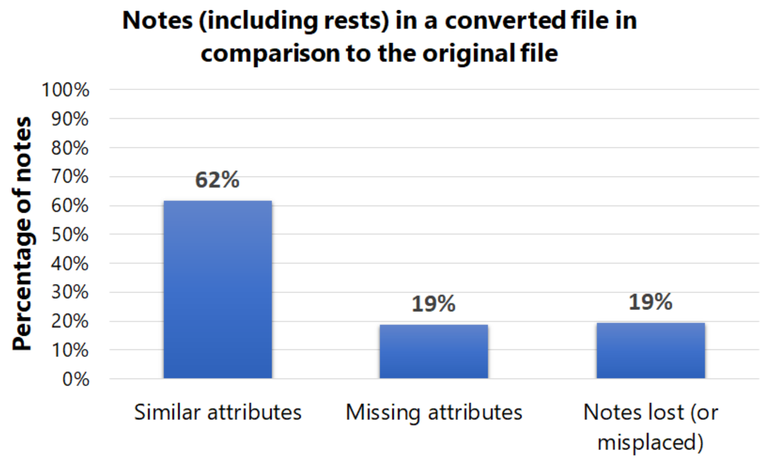
INTRO

- Converting between formats is an inevitable process for any user of symbolic music files. We make an attempt at the problem of measuring the effects that these conversions have in symbolic music files.
- 1200 attempted conversions of symbolic music formats
- 955 successful conversions
- 448 comparisons of the original files and their conversions using *music21*

DATA

- **Humdrum**: 50 random Bach chorales and 50 random Mozart piano sonata movements from the *humdrum-data* repository
- **Lilypond**: 100 random J. S. Bach pieces from the *Mutopia Project*
- **MEI**: 100 random files selected from the MEI *sample-encodings* repository and the *Digital Mozart Edition*
- **MusicXML**: 100 random Beethoven string quartet movements from the *Gutenberg Sheet Music Project*

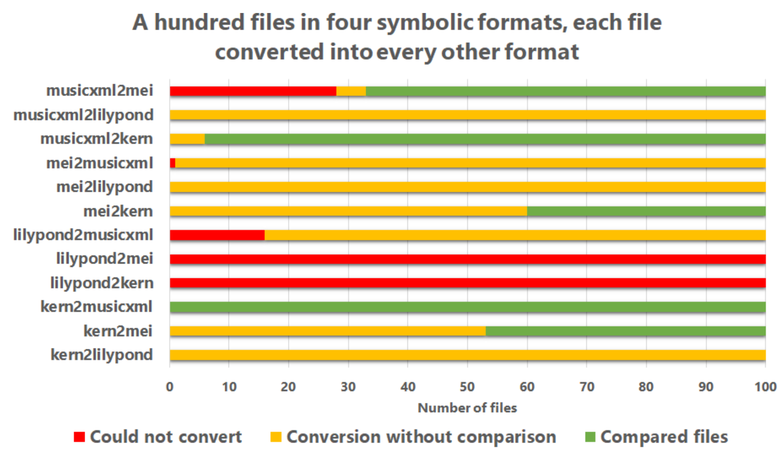
RESULTS



Attributes refer to: pitch, duration, articulations, and ornaments

DISCUSSION

- In our experiment, we could only compare 5 out of 12 translation paths. A consensus for evaluation metrics of symbolic music formats is needed if we want better experiments of this kind

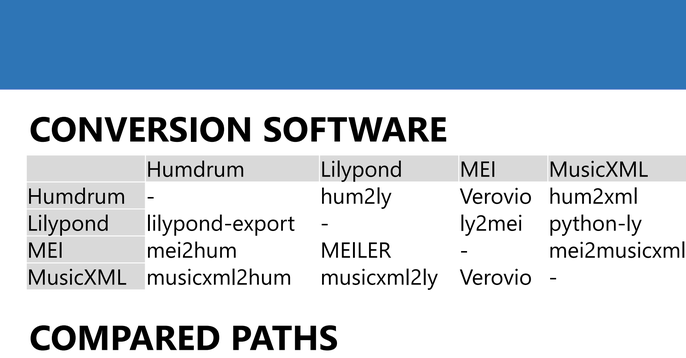


CONVERSION SOFTWARE

	Humdrum	Lilypond	MEI	MusicXML
Humdrum	-	hum2ly	Verovio	hum2xml
Lilypond	lilypond-export	-	ly2mei	python-ly
MEI	mei2hum	MEILER	-	mei2musicxml
MusicXML	musicxml2hum	musicxml2ly	Verovio	-

COMPARED PATHS

Translation software vary considerably in the robustness of their conversion. The plot in the results section is the average observed through all compared conversions



LIMITATIONS AND FUTURE WORK

- Our experiment focuses on detecting that the same notes written in an original file appear in the translation. Other aspects (e.g., metadata and structure of the files) are not being considered
- *music21* has not been designed to treat all formats with the same level of detail (i.e., some formats work better than others). In the case of Lilypond, it is only supported as an output format, yet, *music21* is still the best option to put distinct symbolic music formats in the same, comparable, representation
- A better study can only be achieved when the communities driving each symbolic format look for consensus in evaluation metrics of symbolic music files and file conversions

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Review our code
Replicate our experiment