

Hierarchical Annotation of MEI-encoded Sheet Music

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What?

- A webapp for analysing scores.
- Analysis is seen as relating notes
 - to each other
 - in different levels of significance
 - in a specific type of relation
- Analysis is interaction with the score
- Analysis does not change the score itself

Why?

- For encoding existing analyses
- For making new analyses
- For teaching analysis
- For visualizing analyses

How?

- Render MEI[2] or MusicXML[1] using Verovio[3]
- Click to select, shift-click to prioritize
- Choose or specify a type of relation
- Fetch MEI including encoded relations

```
<!-- node xmlid= "gn-note-L29F2" -->
<!-- clabel -->
<note sameas="#note-L28F2"/>
</note>
<node type="hyperedge" xmlid="he-5cc84">
  <clabel type="neighbour"/>
  <node>
    <arc from="#he-5cc84" to="#gn-note-L27F2" type="secondary"/>
    <arc from="#he-5cc84" to="#gn-note-L28F2" type="primary"/>
  </node>
  <node xmlid="gn-note-L29F2">
    <clabel>
      <note sameas="#note-L29F2"/>
    </clabel>
  </node>
  <node xmlid="gn-note-L30F2">
    <clabel>
      <note sameas="#note-L30F2"/>
    </clabel>
  </node>
  <node type="hyperedge" xmlid="he-3db04">
    <clabel type="passing"/>
    <node>
      <arc from="#he-3db04" to="#gn-note-L29F2" type="secondary"/>
      <arc from="#he-3db04" to="#gn-note-L28F2" type="primary"/>
      <arc from="#he-3db04" to="#gn-note-L30F2" type="primary"/>
    </node>
  </node>
</node>
```

Figure 1:Example MEI graph encoding, based on the scheme in [4]

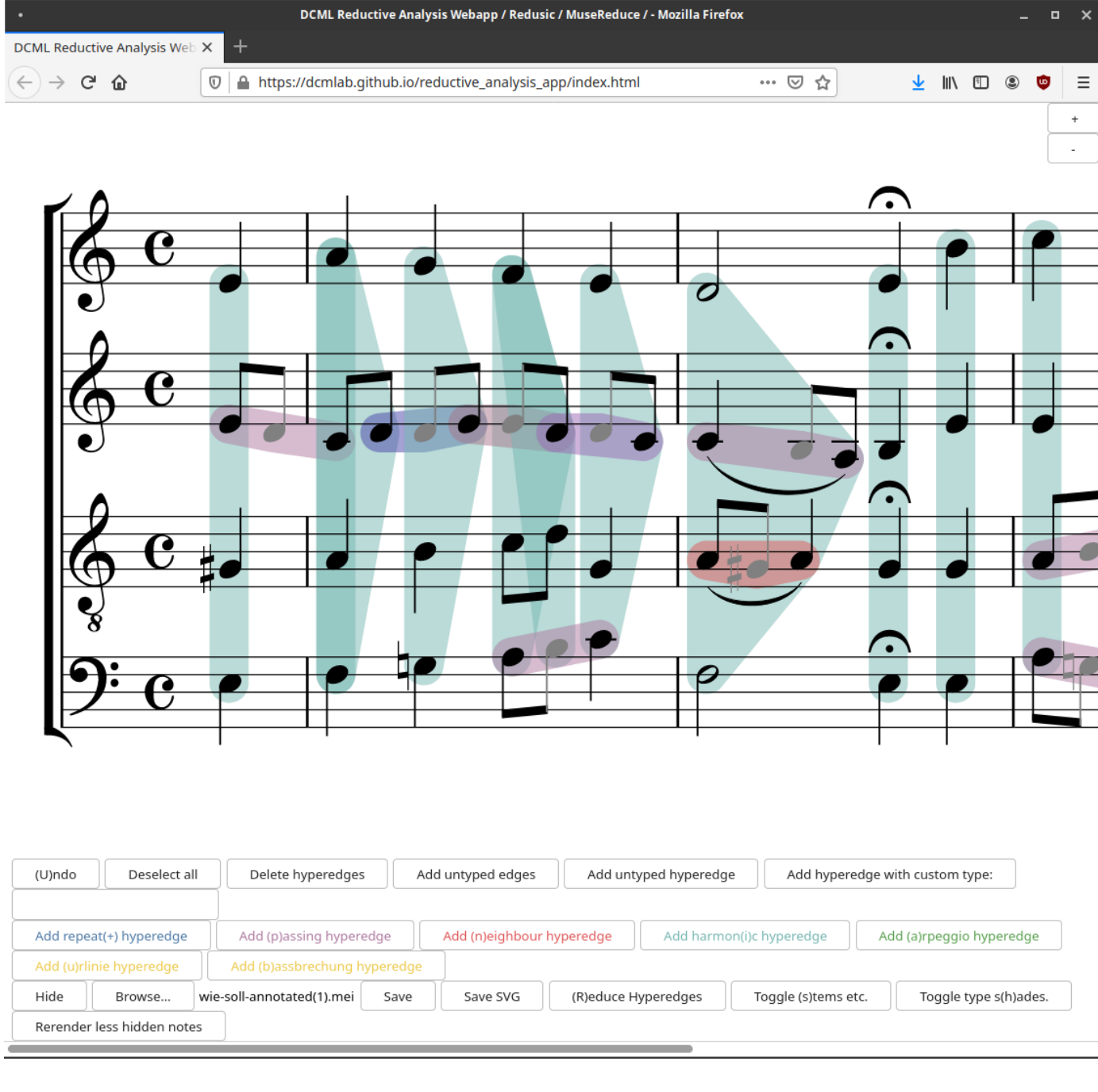


Figure 2:The webapp in action. The teal areas denote harmonic relations, red neighbour relations, blue repeated notes, and purple passing motions. Greyed-out notes are secondary.

Showcase: Schenkerian analysis

Figure 3:Mozart, Piano Sonata K. 545, II, bars 1-6, reduction from Cadwallader and Gagne 2011 "Analysis of Tonal Music: A Schenkerian Approach", p. 118. Animation available at: https://dcmlab.github.io/reductive_analysis_app/images/schenker.gif



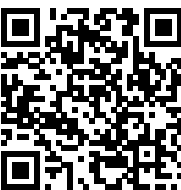
Showcase: GTTM Tree

Figure 4:Bach, "O Haupt voll Blut und Wunden", BWV 244/44, analysis from Lerdahl and Jackendoff 1983 "A Generative Theory of Tonal Music", p. 115. Animation available at: https://dcmlab.github.io/reductive_analysis_app/images/gttm.gif



Showcase: MOP Annotation

Figure 5:Chopin, Mazurka, op. 33/2, reduction and analysis from Yust, 2018 "Organized Time: Rhythm, Tonality and Form", pp 33-34. Animation available at: https://dcmlab.github.io/reductive_analysis_app/images/mop.gif



Future Work

This app is under active development. The source code can be found at https://github.com/DCMLab/reductive_analysis_app/. Our intention is to support computational musicology by building a tool for encoding both existing and new hierarchical analyses of symbolic music into a standardized form.

References

- [1] M. Good. "MusicXML for notation and analysis". In: *The virtual score: representation, retrieval, restoration* 12 (2001), pp. 113–124.
- [2] A. Hankinson, P. Roland, and I. Fujinaga. "The Music Encoding Initiative as a Document-Encoding Framework.". In: *ISMIR*, 2011, pp. 293–298.
- [3] L. Pugin, R. Zitellini, and P. Roland. "Verovio: A library for Engraving MEI Music Notation into SVG.". In: *ISMIR*. 2014, pp. 107–112.
- [4] D. Rizo and A. Marsden. "An MEI-based standard encoding for hierarchical music analyses". In: *International Journal on Digital Libraries* 20.1 (2019), pp. 93–105.

Funding

The research presented on this poster is generously supported by Claude Lattour. This project has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation programme under grant agreement No 760081 – PMSB.



The submitted extended abstract for this research can be found at:

