Deciphering Music DNA:

Translating Music Pedagogy's Deep Insights with Novel Computing Paradigms

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Inspiration

"Which piano concerto is more difficult: Rachmaninoff's Second or Third?"
Performers, band directors, educators, and publishers would like to find out.
State of the practice---analyze music scores by hand.
"Would you rather spend your precious time on more creative pursuits?!"

Problem Statement

- Music educators and musicians need to accurately assess the complexity of music pieces to determine what they can best perform.
- Current methods of scoring are subjective and are often inaccurate.
- Users need a simple tool to quickly expose the underlying complexity of a piece automatically.

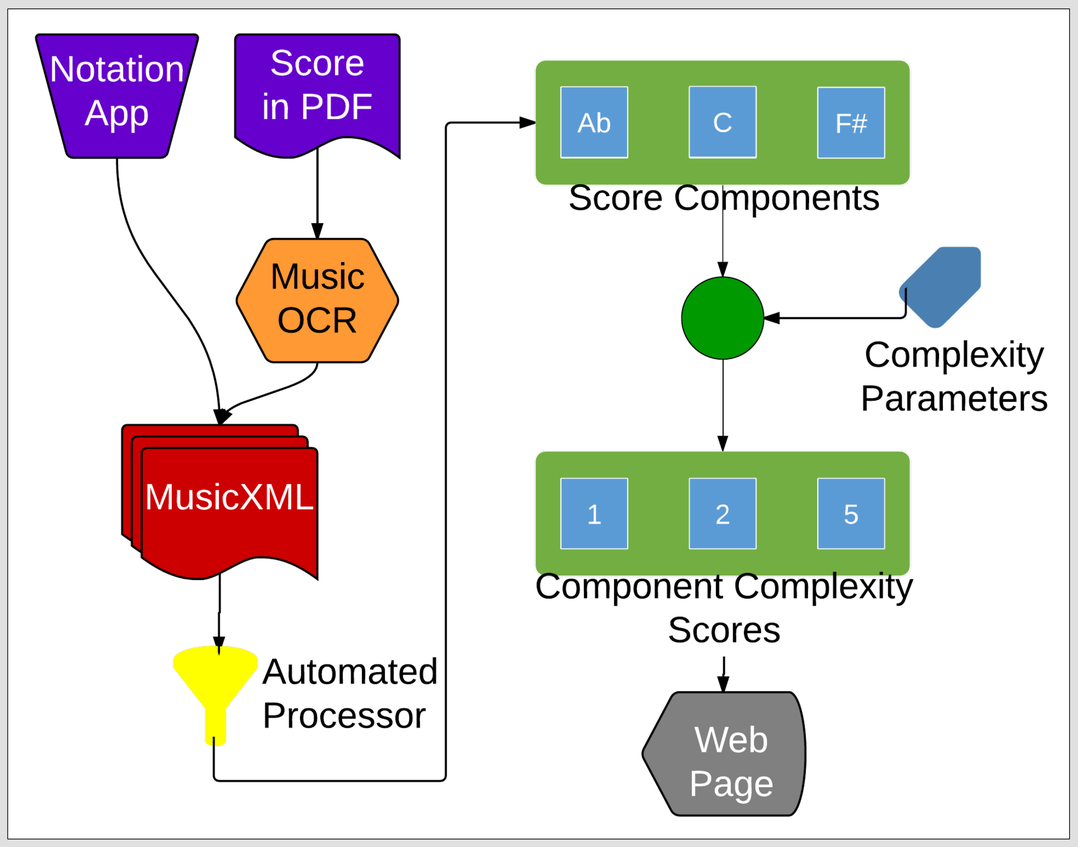
Solution Approach Overview

Step 1: Gathering Information
- Survey instrument experts to determine a consensus for the difficulty of certain musical elements.

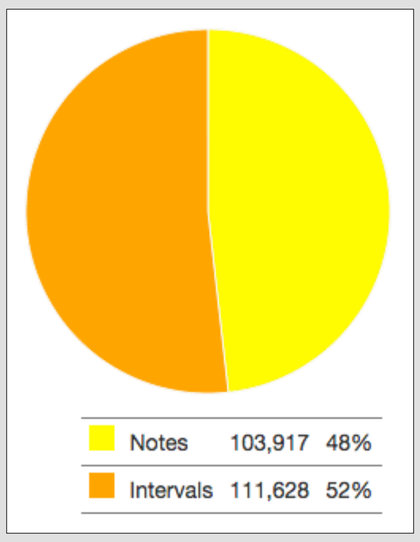
Step 2: Mapping Complexity
- Statically analyze the musical elements of a piece and map them to the specified difficulties in Java.

Step 3: Passing Data
- Determine the final score and meta data and pass it to the web interface as JSON.

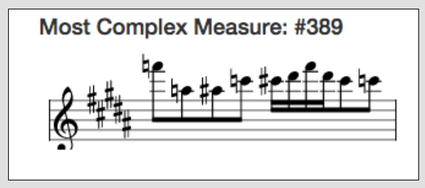
Step 4: Revealing Insights
- Leverage Javascript libraries to display the final score and meta data in an easily readable form.



Exploring Complexity at Different Levels of Granularity



Overall Complexity:
Notes vs. Intervals Breakdown



Practical Impact

- Enable objective and accurate complexity evaluation for music educators and performers.
- Automate tedious, subjective process.
- Free user resources for creative tasks.
- Apply music pedagogy insights to create novel computing paradigms.

Technical Details

- HTML5 web-based application hosted in the cloud.
- Evaluation algorithm implementing a high fidelity, bottom-up scoring heuristic.
- Computing engine scalable with score length and instruments involved.

Applicability

- Can analyze MusicXML for single or multi-part scores.
- Limited instrument difficulty settings.
- Need expert feedback to determine further difficulty settings.

Future Work

- Support hand-written scores with music OCR.
- Include a broader set of instruments.
- Collaborate with music libraries, such as *imslp.org*.

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