Auto-completion for classical music motives

Artur Dobija, Björn Keyser | room 04.28

Universiteit Leiden
The Netherlands

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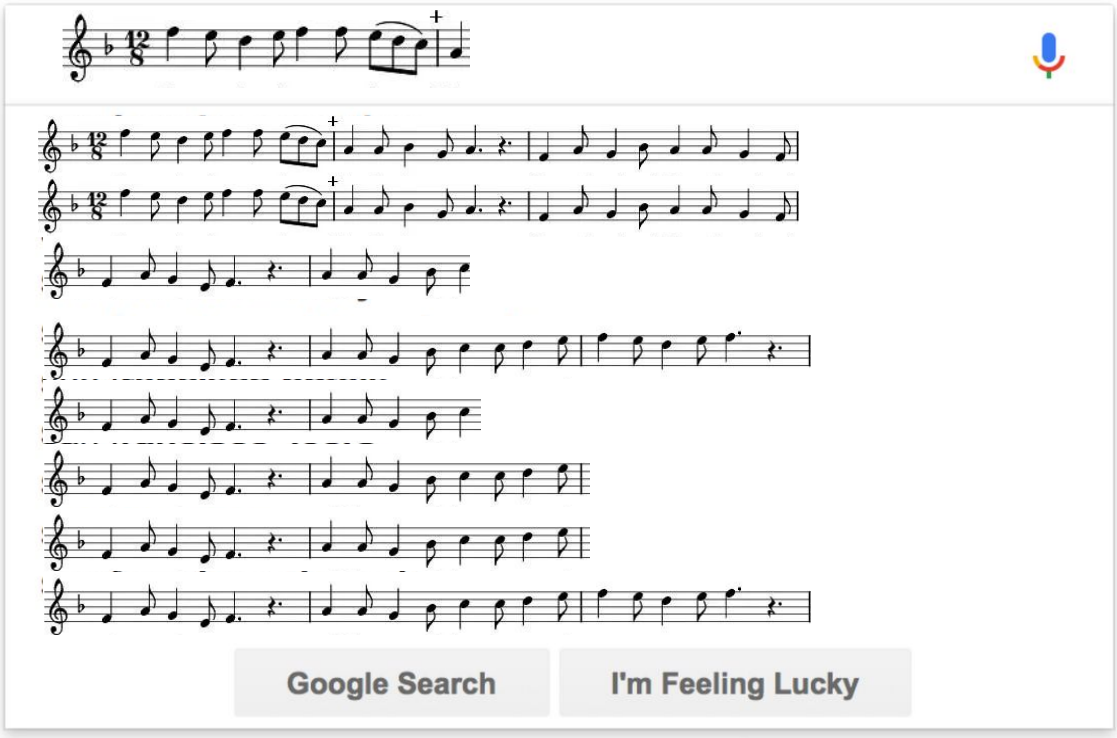

Introduction

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Research question

Does an auto-completion system
for classical music motives
educate users
on classical piano sonata repertoire?

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Auto-completion

Intuitive definition (Wikipedia)**:**

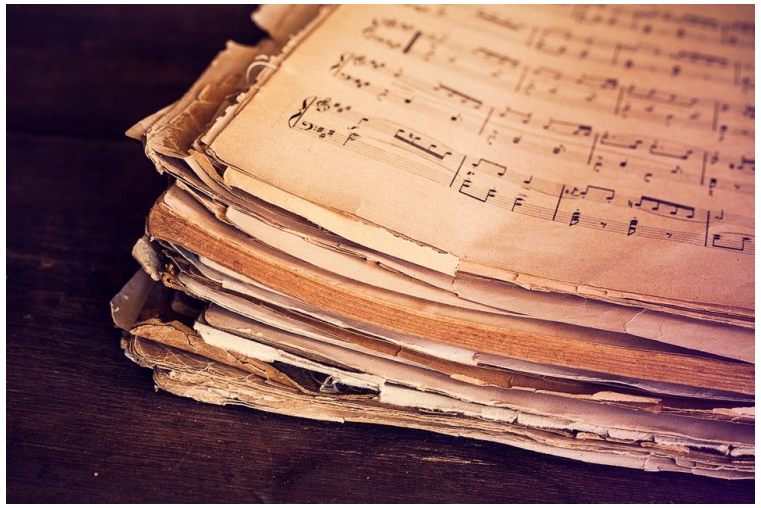
a feature in which an application predicts the rest of a word a user is typing.

Formal definition [Gog & all. 2020]**:**

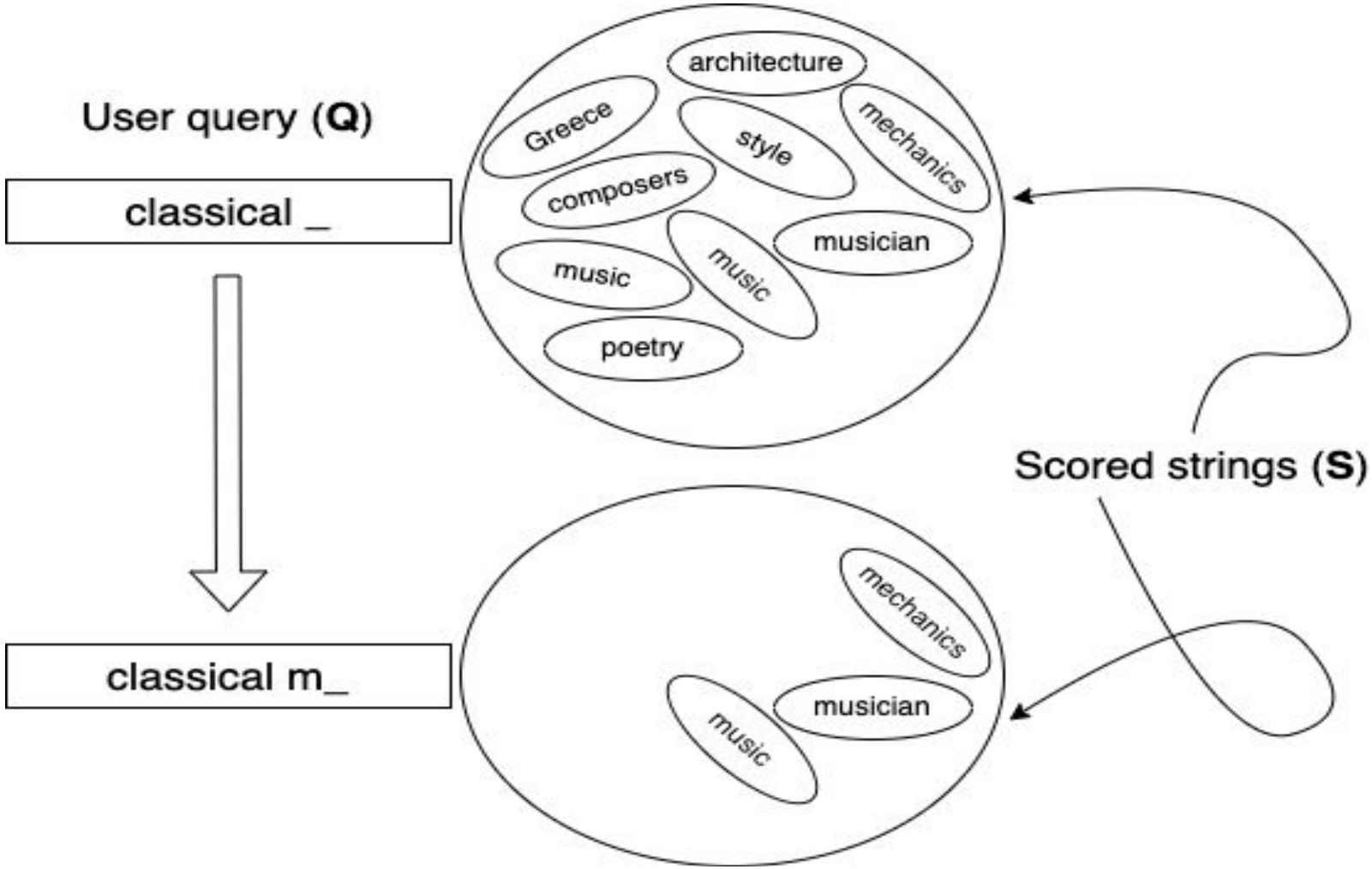
given a collection **S** of scored strings
and a partially-completed user query **Q**

find the top-**k** scored completions that match **Q** in **S**.

+



Auto-completion



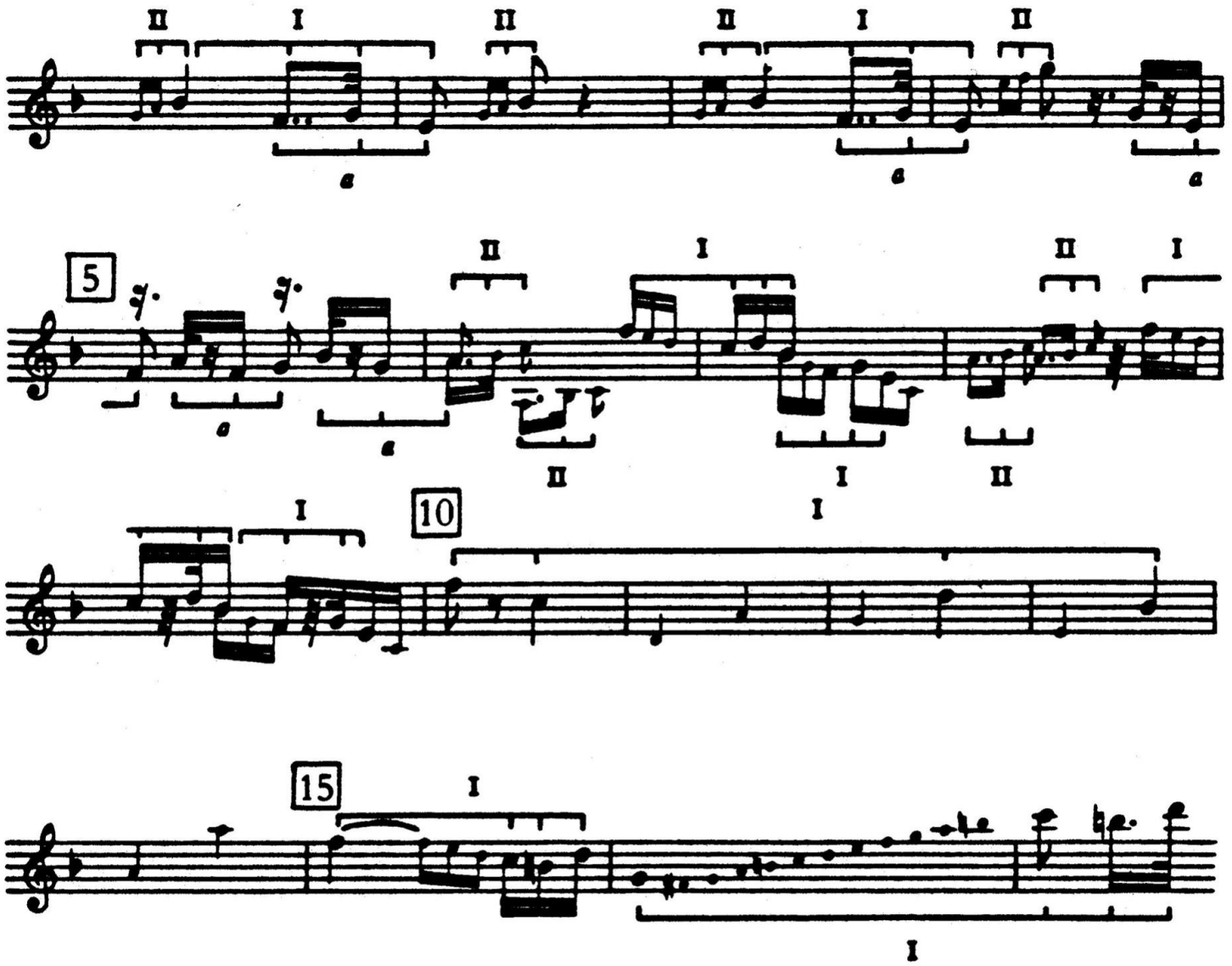
Musical motive

Intuitive definition:

the characteristic, small and meaningful part of the melody different.

Formal definition [Caplin, 2013]**:**

a collection of several notes constituting the smallest meaningful melodic or rhythmic configuration.



Rudolf Réti's analysis of Beethoven, String Quartet, op. 135, mvt I, mm. 1-17

Education

Quests for :

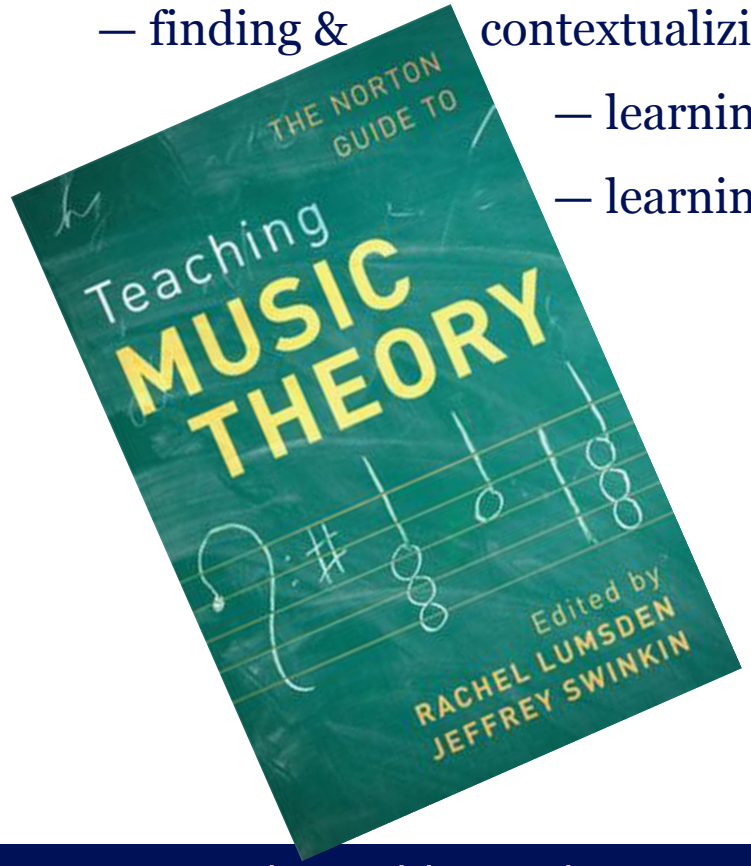
— interactive tools for music theory … *which are there but …*

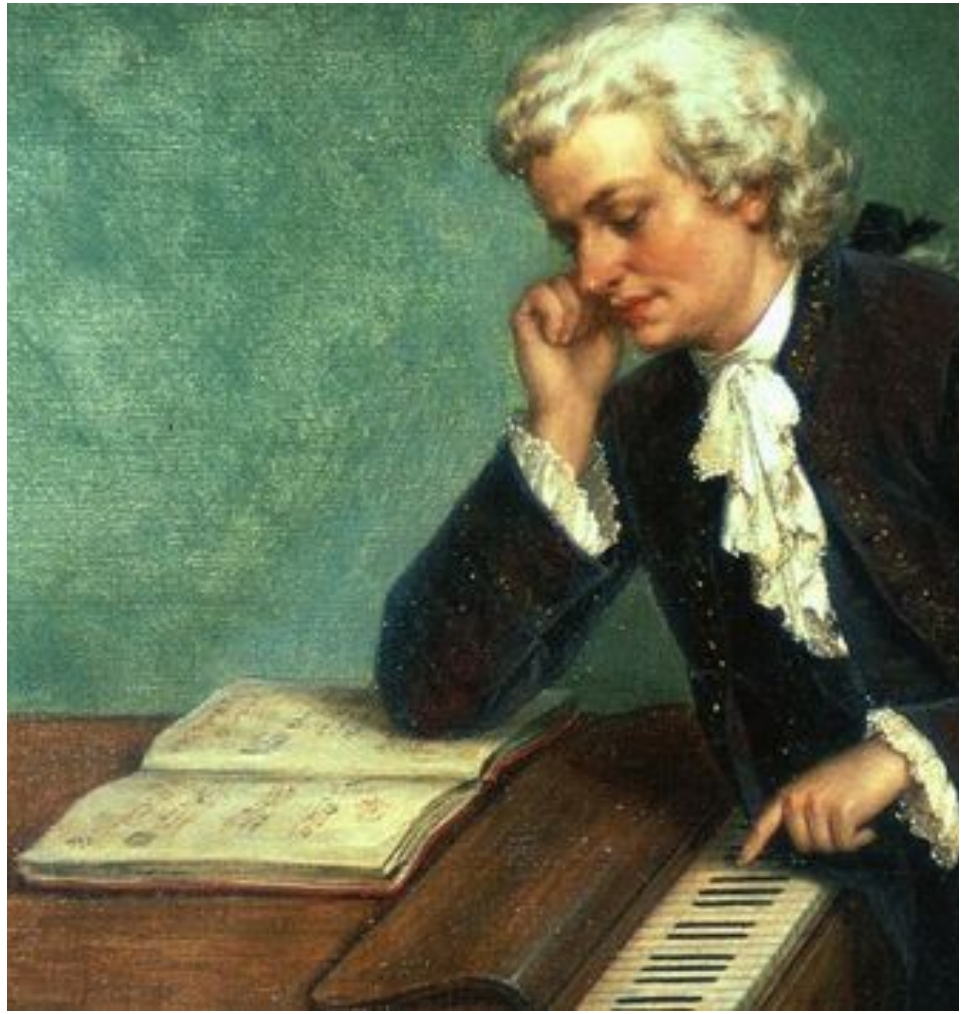
— independent and individual exploration

— finding & contextualizing musical patterns

— learning from practice

— learning close to music

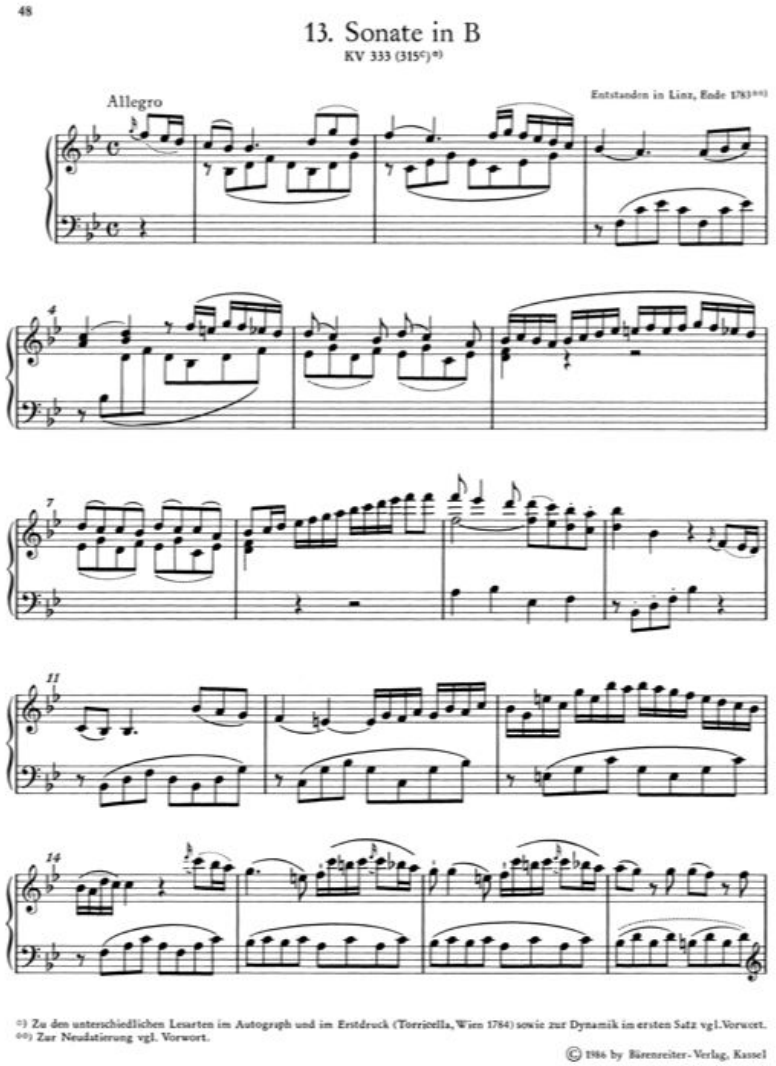




Classical piano sonata repertoire

Why?

- well studied repertoire
- many famous tunes
  - KV 545 C-major *"Facile"*
  - KV 331 A-major with Variations)
- many textbooks examples
  - KV 333 B-flat major
- encoded … to … … hu m d r u m



Maria Anna "Nannerl" Mozart, sister of Wolfgang Amadeus

Product Plan

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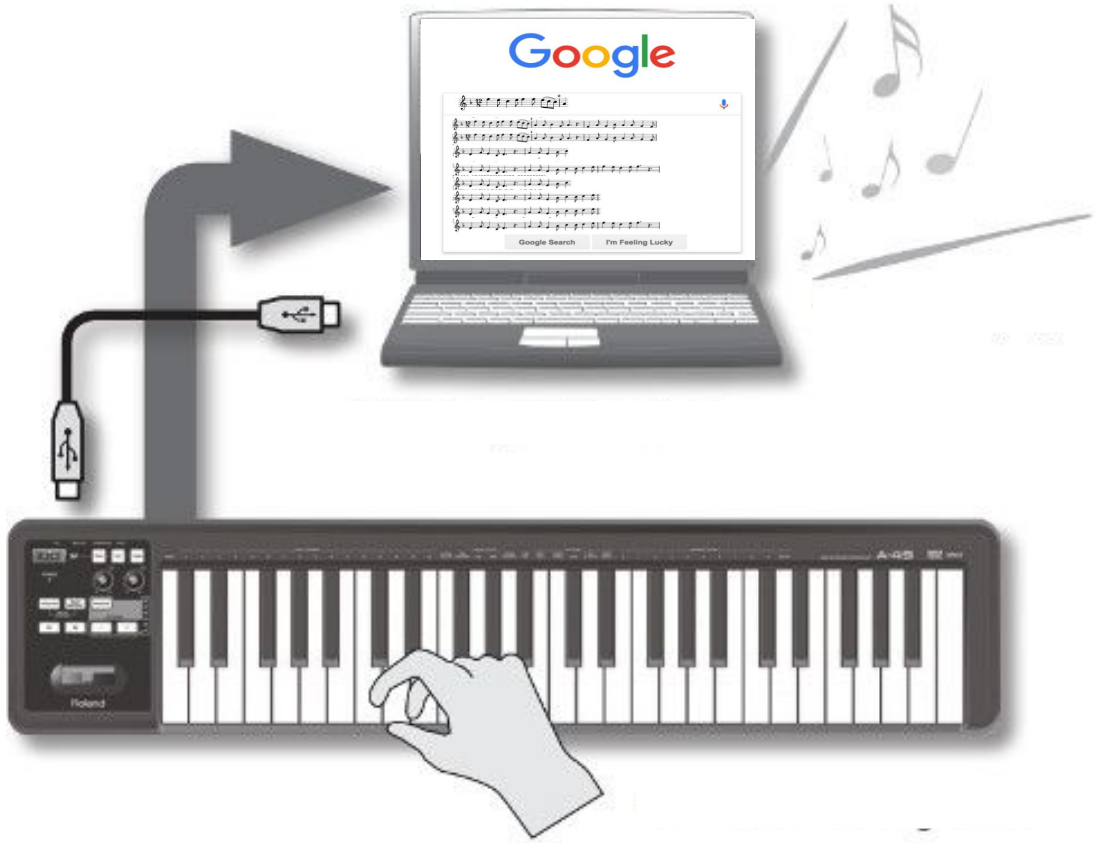
Idea

User queries a **database** of musical scores using MIDI **keyboard**.

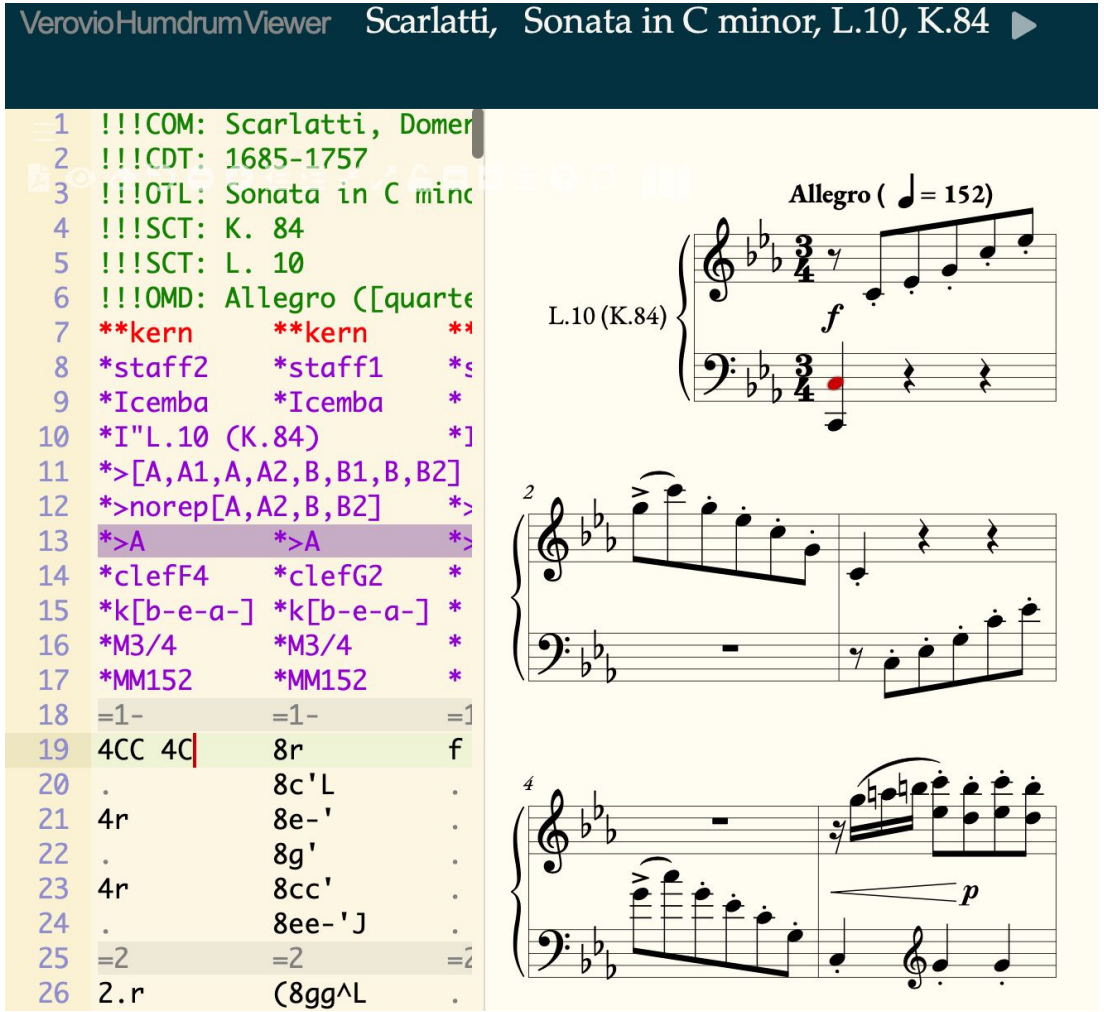
The result of the query **displays** on the screen.

…proposed examples may be played out



Humdrum

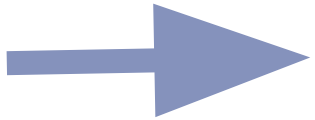
1. **Repository**
    a. databases of scores
    b. **kern file format
    c. designed to capture “semantics” of the score notation
2. **Toolkit**
    a. database query and manipulation
    b. command-line tools
    c. designed for statistical analysis
3. **Verovio Humdrum Viewer**
    a. Verovio browser plugin
    b. score displayer

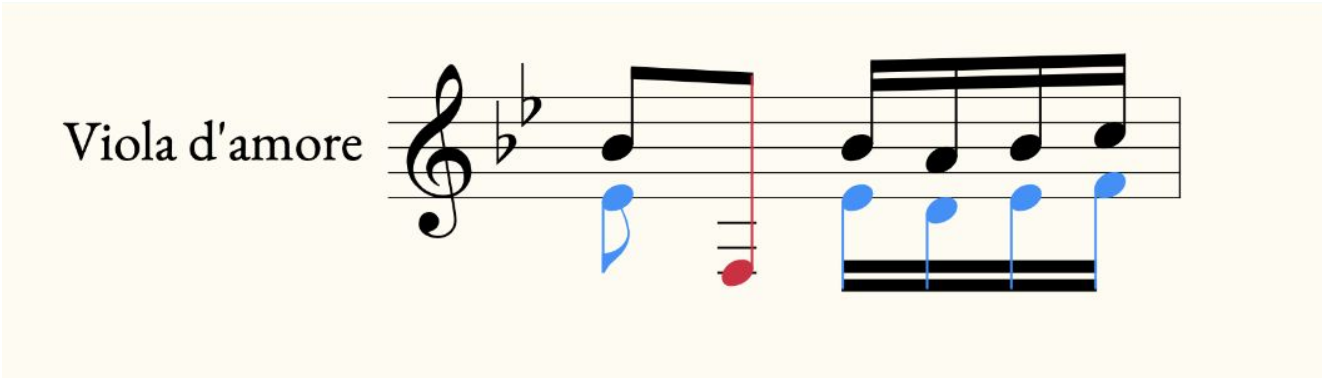


Humdrum

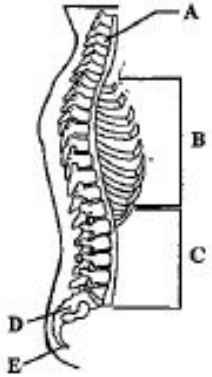
**kern

```
1  **kern
2  *staff2
3  *I"Viola d'amore
4  *k[b-e-]
5  *^
6  8b-L          8gZ
7  8GJV          8ryy
8  16b-L         16gLZ
9  16a           16f#Z
10 16b-          16gZ
11 16ccJ         16aJZ
12 *v            *v
13 *
14 =
15 *-
```





`correl` !



MIDI keyboard

Akai MPK mini mk3

MIDI keyboard (for now?)

Akai MPK mini mk3

Pressure-sensitive pads

Joystick

"Endless" encoders

Velocity-sensitive Mini Keybed

MIDI keyboard (…issues)

Akai MPK mini mk3

Keyboard behaviour controller

Pressure-sensitive pads

"Endless" encoders

Joystick

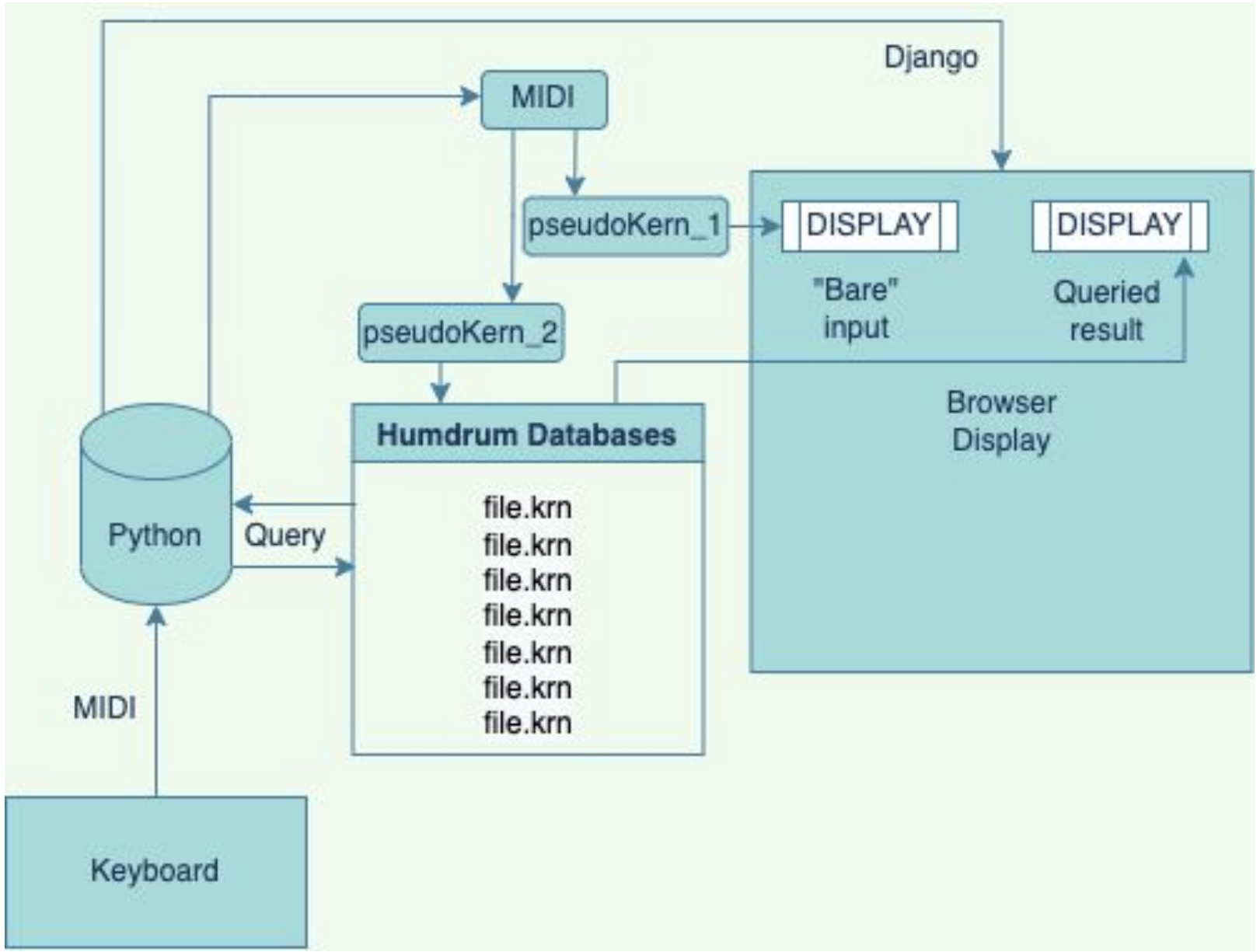
Arpeggiator section

Velocity-sensitive Mini Keybed

Backend

Key components:

- Hardware controller (keyboard)
- Humdrum Database/Toolkit
- Verovio browser plugin (display)
- Python & Bash scripts



User Analysis

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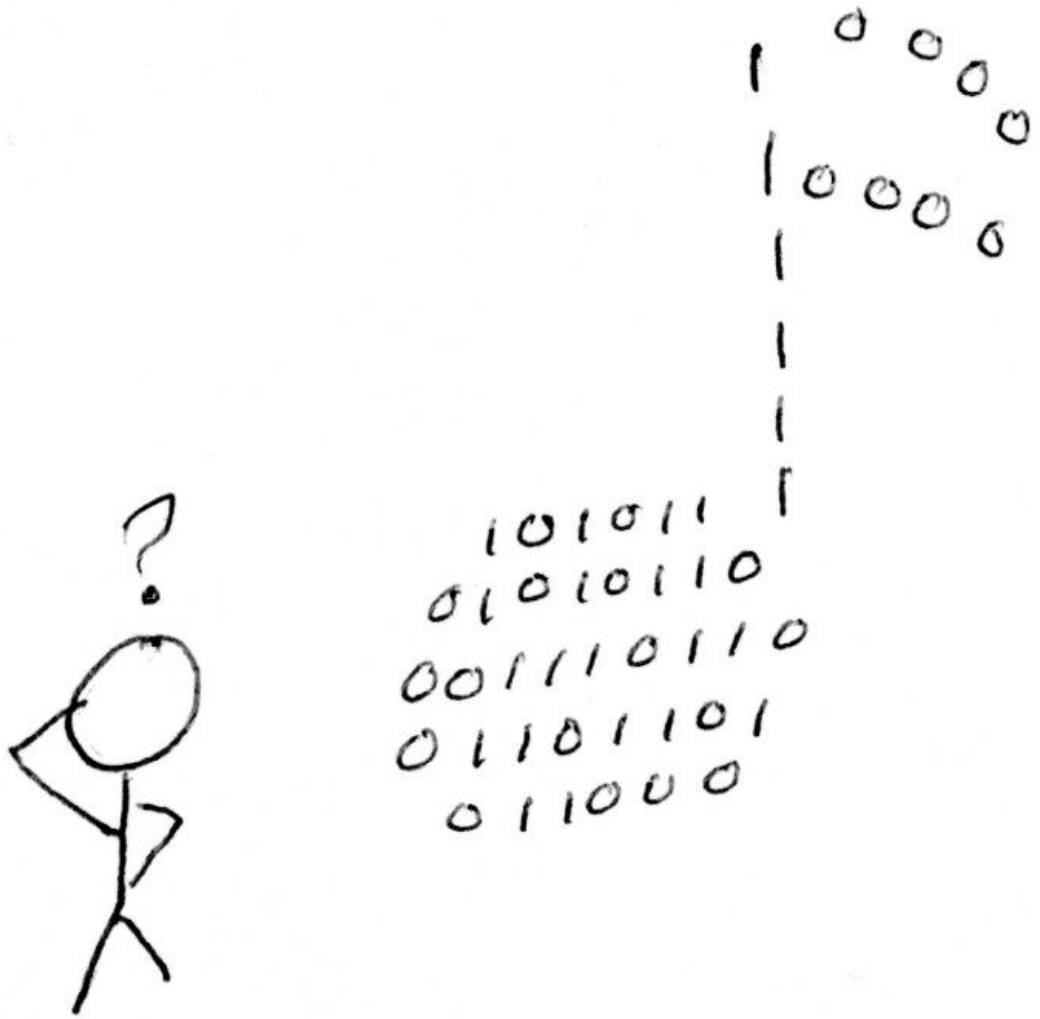
User Analysis

Persona:

Eva is a doctor of medical sciences. When she was a child, her father encouraged her to take piano lessons. Due to the school and other additional exercises, she attended those lessons intermittently and soon abandoned the idea. Now, when she is in her mid-thirties and her career has significantly flourished, she decided to give the second chance to the opportunity she had missed as a child. She needs some advice on how to begin again her adventure with the classical piano repertoire.

User Analysis



Considering varying degrees of musical background knowledge:

• Will users intuitively understand the behaviour and interaction flow with our software only on the basis of program's perceived affordances?

• Can people with a background in music find a musical score of their choice using our program?

– What is the speed of task performance?

– What is the error rate?

• Do the users without a background in music find the software entertaining to the degree that they would like to interact with in the future?

• How long does it take for a user to learn the midi enabled navigation shortcuts?

Design

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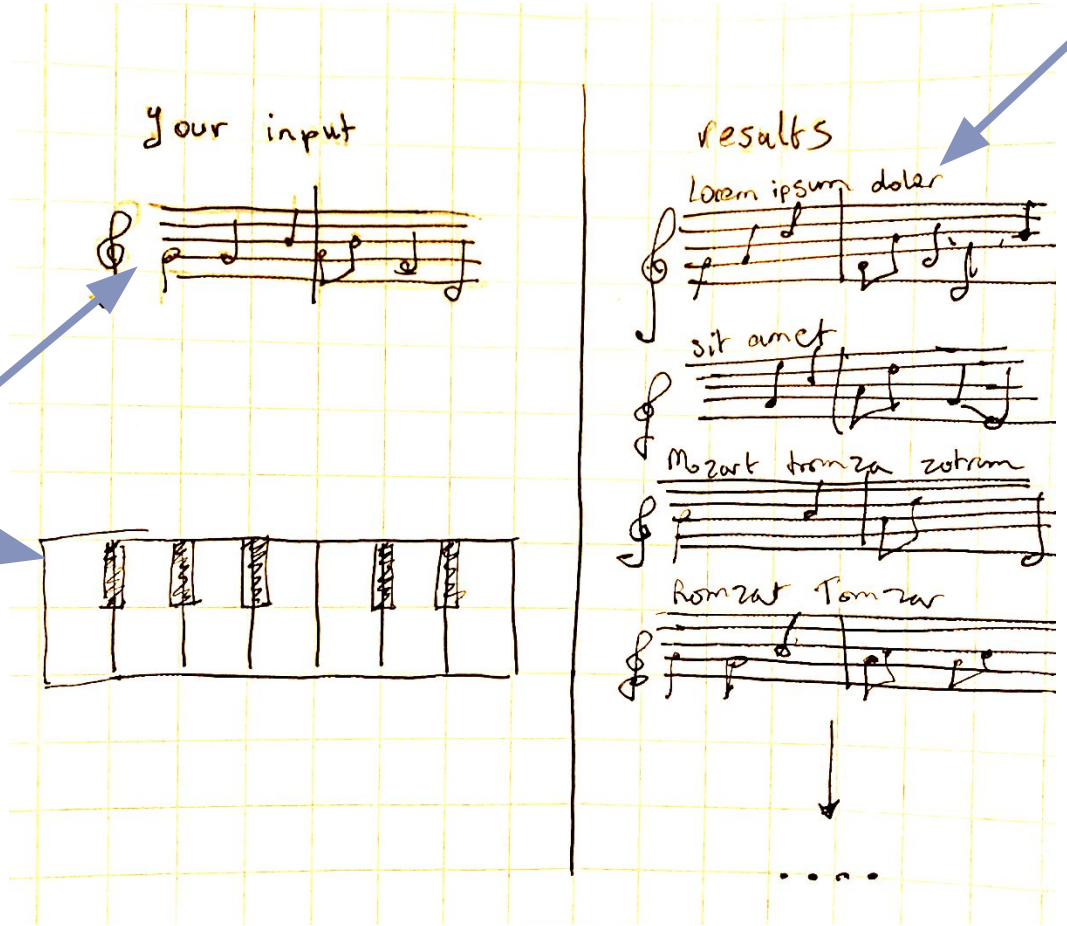
Design



Results

MIDI keyboard input

Questions? Comments (or name suggestions?)

we were thinking of a Mozart anagram..

Tromza
Maztor
Trazom
Mazort

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