

Audiveris



MUSIC HACK DAY, Vienna 2013

Audiveris ***Optical Music Recognition***

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February 2, 2013

Agenda

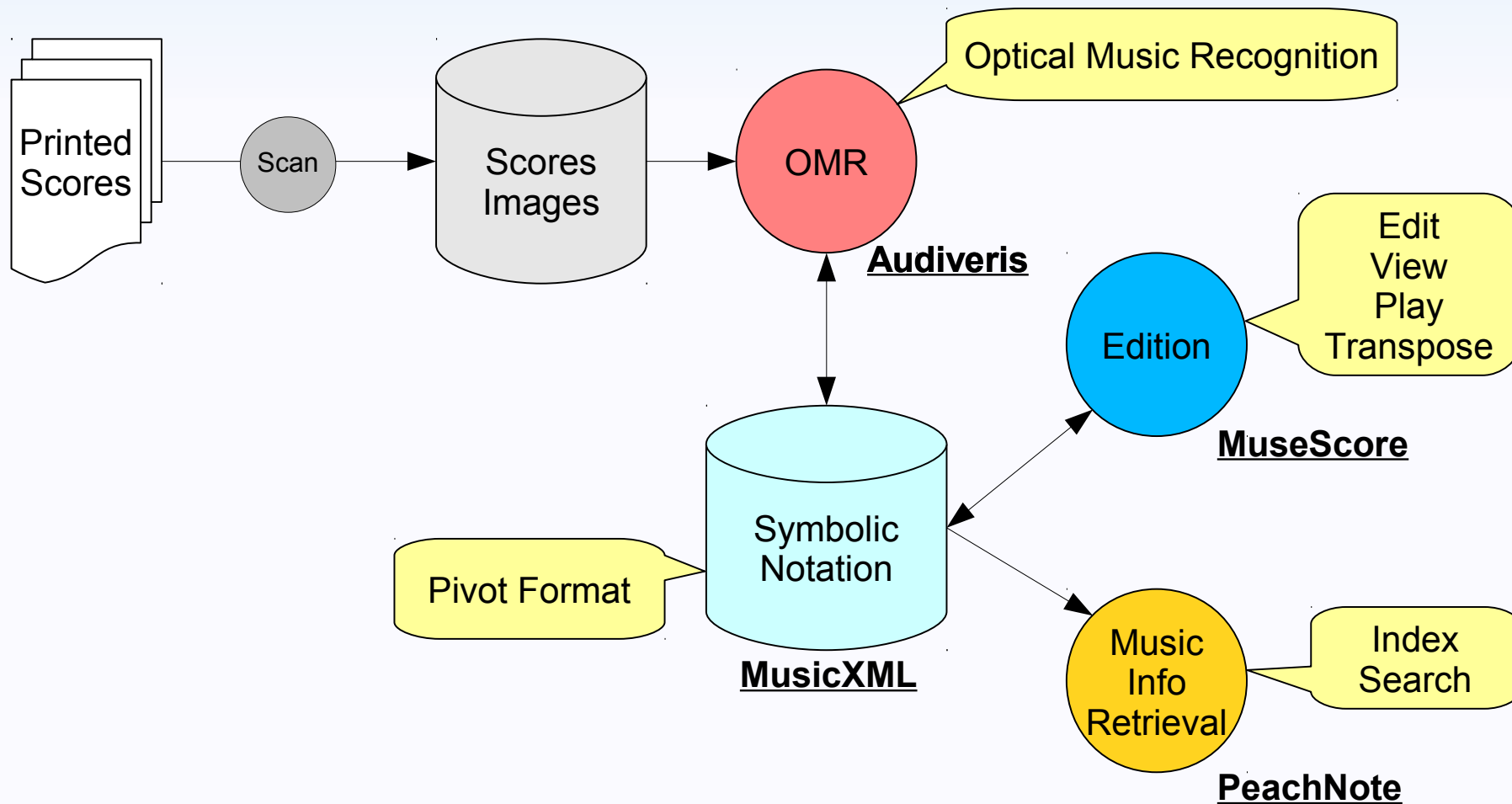
- User demo
- The big picture
- AudiVeris technology
- Current 4.2 release
- Integration
- Future

User Demo

- User oriented
 - ✓ Input
 - ✓ Corrections
 - ✓ Outputs

- Case
 - ✓ Input : Dichterliebe01.pdf
 - ✓ Language : DEU
 - ✓ Tempo : 80
 - ✓ Output : Finale Notepad

Score Transcription « big picture »



Music notation

- **MusicXML**
 - ✓ Symbol level
 - ✓ Meant for score interchange
- **MIDI**
 - ✓ Note level
 - ✓ Meant for digital instruments
- **MP3**
 - ✓ Sound level
 - ✓ Meant for recorded music

High level



Low level

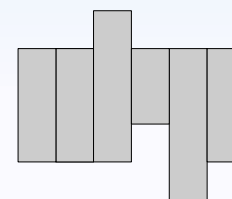
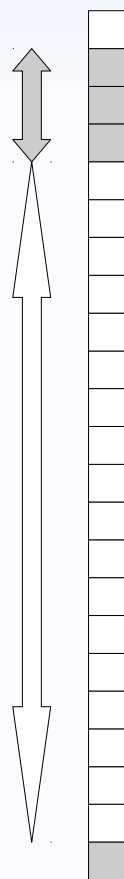
OCR vs OMR

	OCR (text)	OMR (music)
Complexity	Horizontal lines of characters	Combined horizontal & vertical directions
Technology	Rather mature	Several years behind OCR
Products	Many	Just a few. One FOSS: Audiveris

Basic definitions: Runs & Sections

Black run of 3 pixels

White run of 18 pixels



Section of 6 adjacent runs

Tech Demo

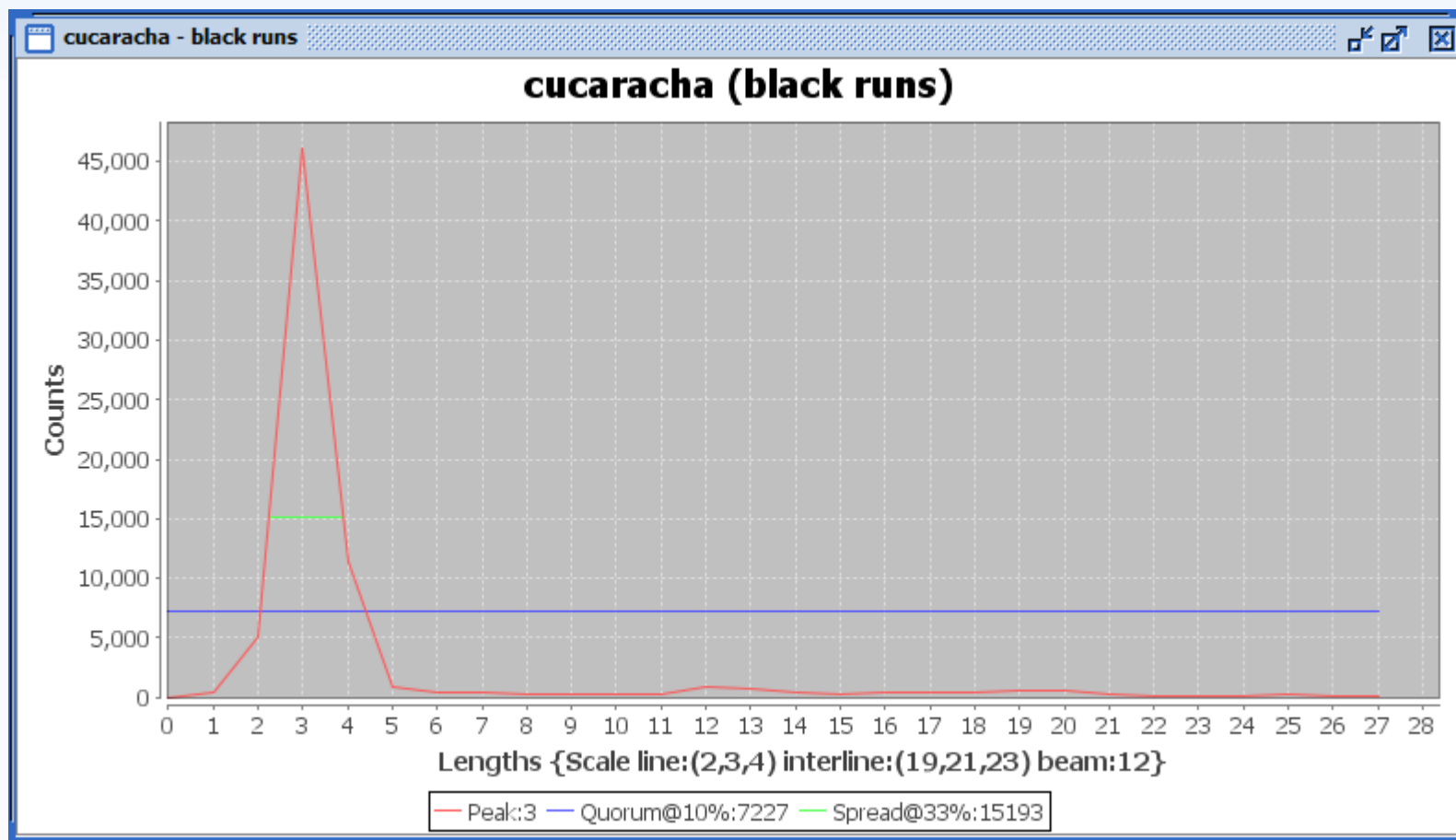
- Technology oriented
 - ✓ Runs
 - ✓ Grid
- Case
 - ✓ Input : Chula.png
 - ✓ Language : FRA
 - ✓ Params : showRuns, showCombs
 - ✓ Output : MuseScore

Pixels: Staff Lines & other objects

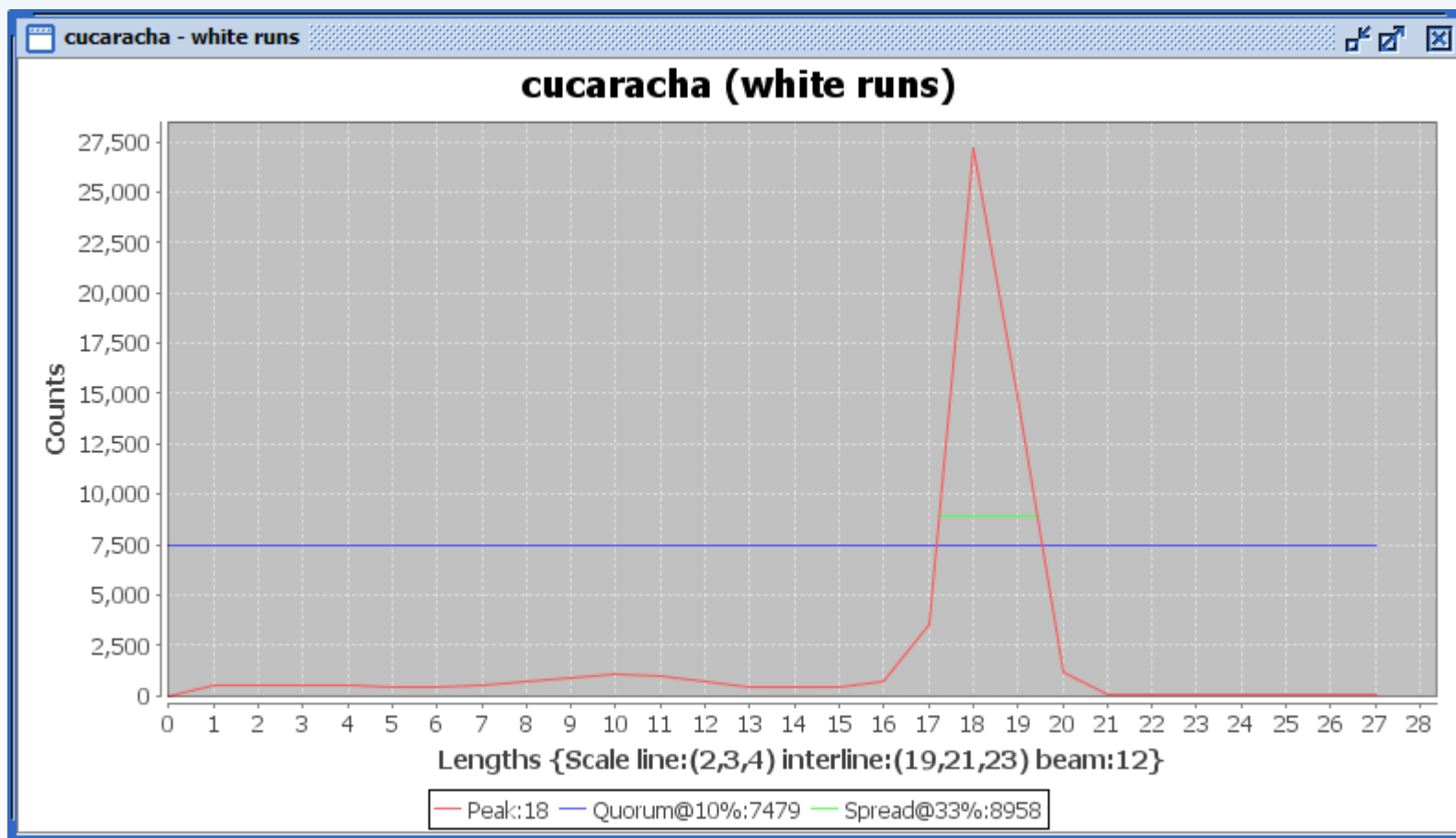
Rapide et joy

mf

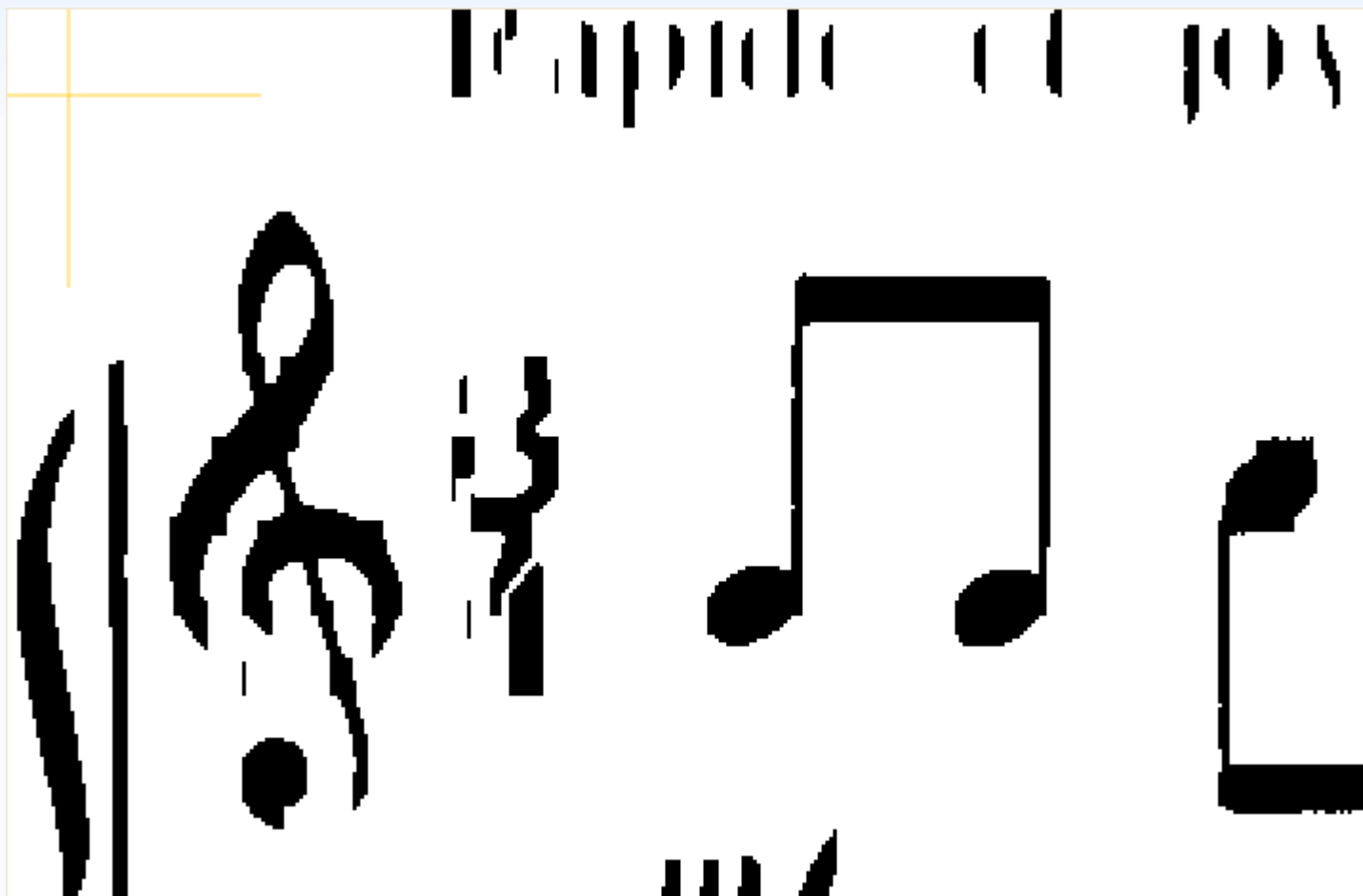
Black runs histo. → line thickness



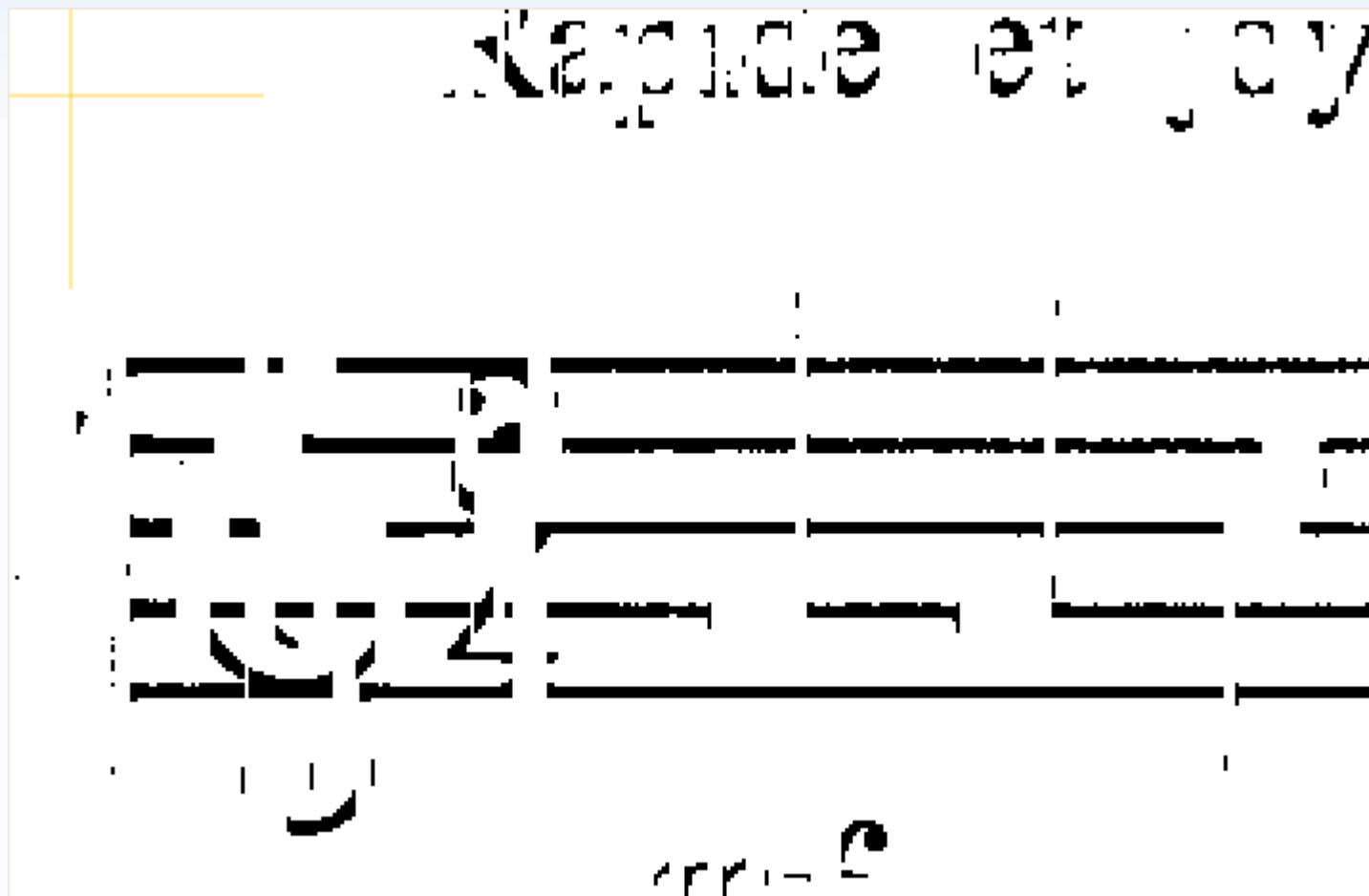
White runs histogram → interline



Vertical runs > line thickness



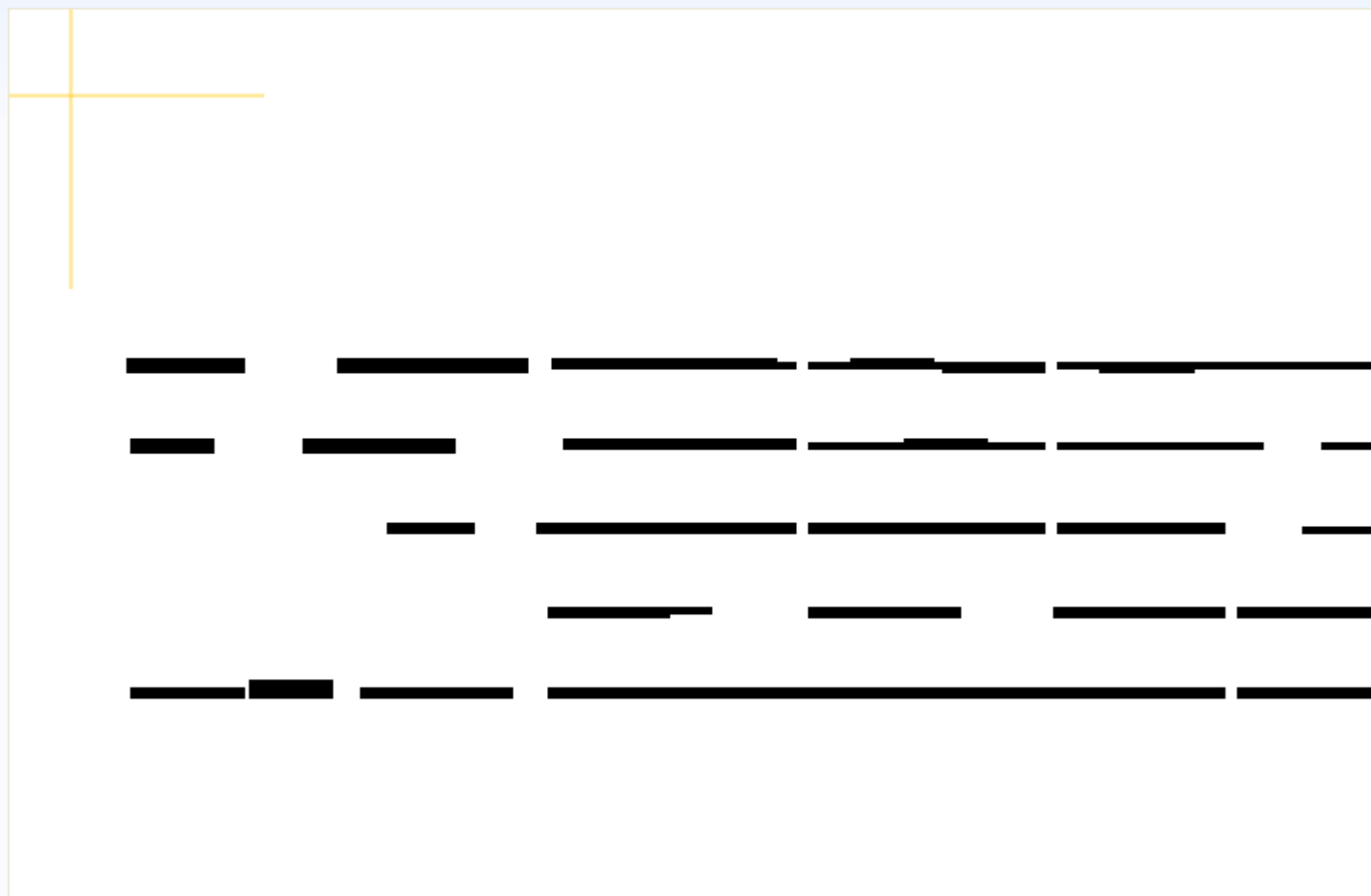
Vertical runs \leq line thickness



Short horizontal runs put aside



Long hori. runs → lines skeleton



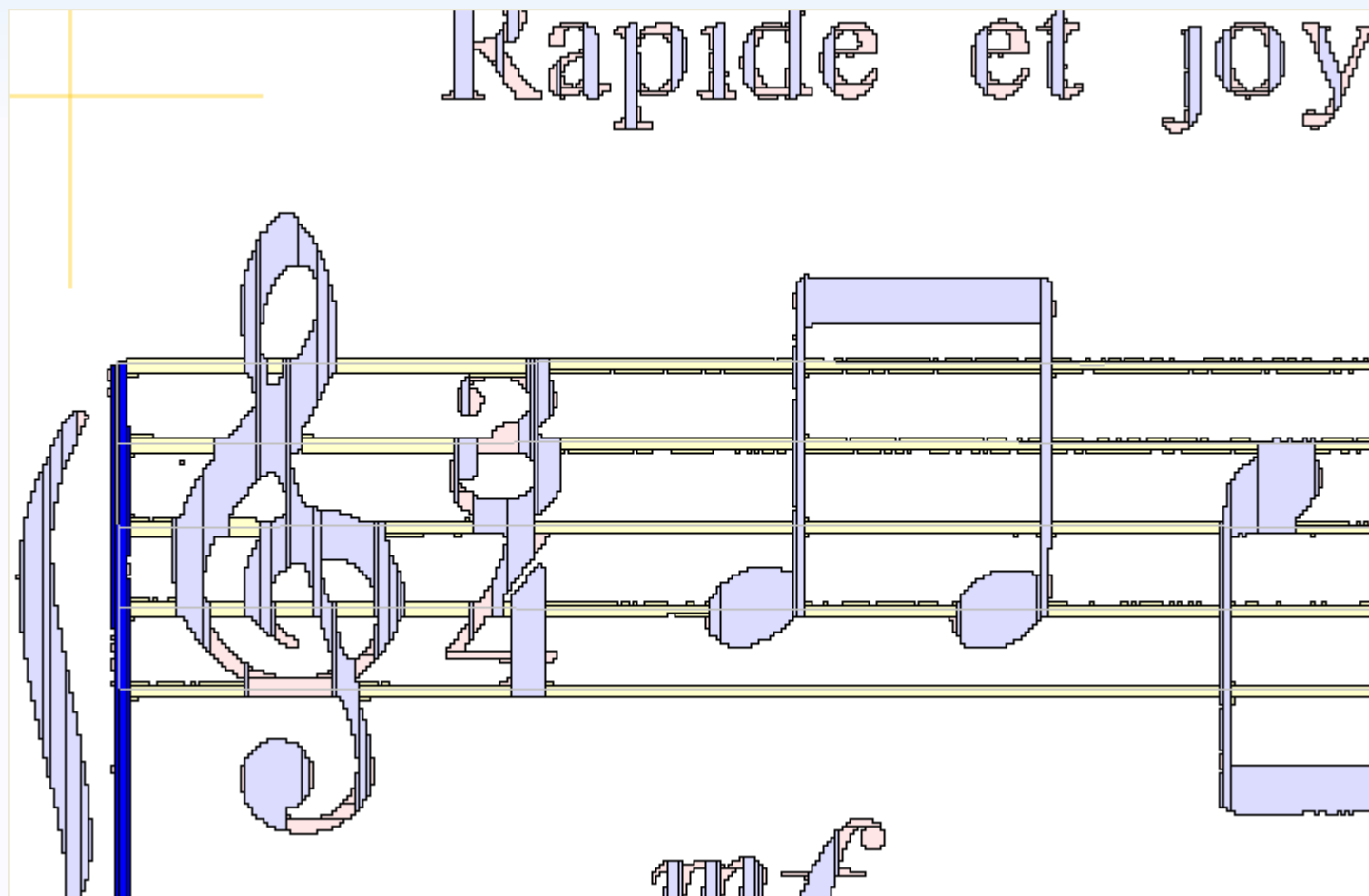
Clusters of equidistant lines

Rapide et joy

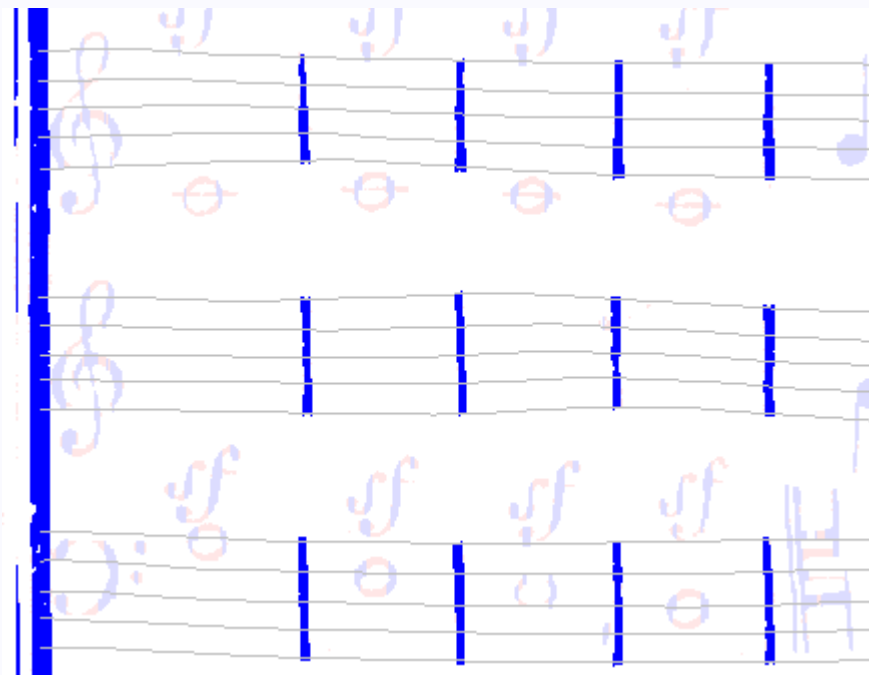
mf

The image displays a musical score for the piece 'Rapide et joy'. The score is presented on a yellow background with a grid of horizontal lines. The notation is rendered in blue and red. It begins with a treble clef, followed by a 3/4 time signature. The first measure contains a quarter note on the second line of the staff. The second measure contains a quarter note on the second line. The third measure contains a quarter note on the second line. The fourth measure contains a quarter note on the second line. The dynamic marking *mf* is placed below the staff. The tempo and mood 'Rapide et joy' are written above the staff.

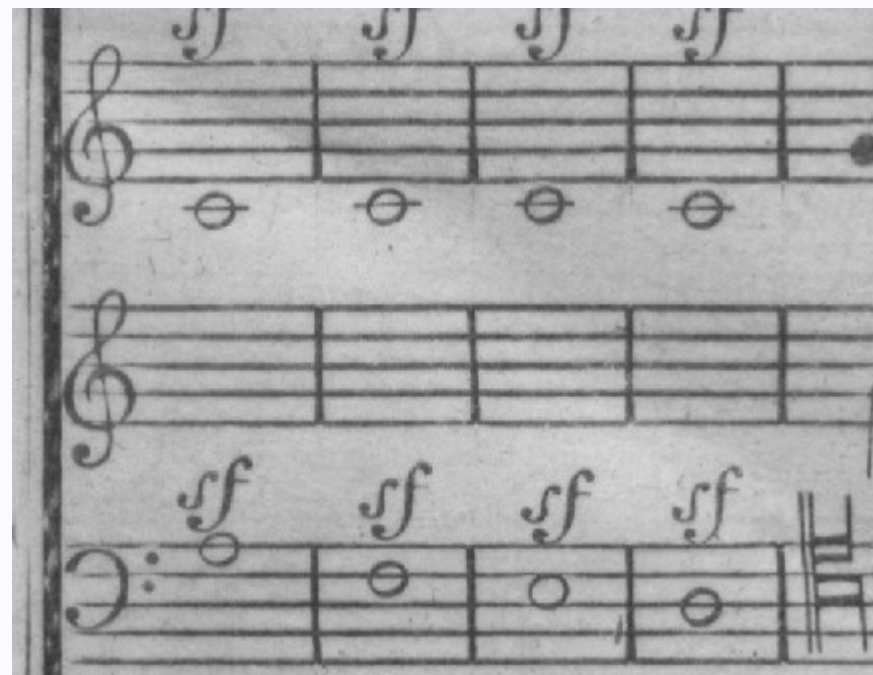
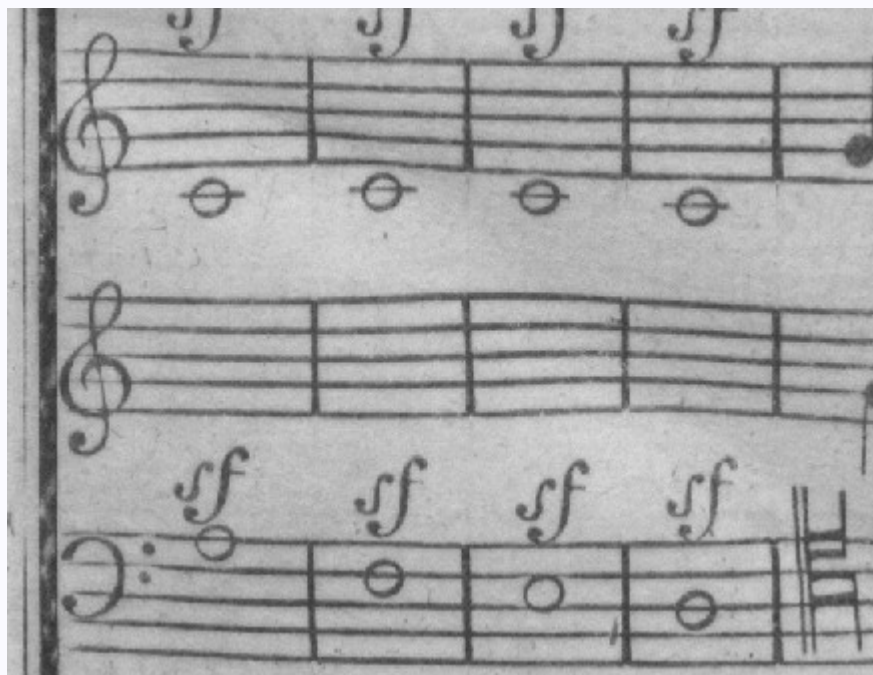
Staff lines detected



Wavy staff lines: Splines



Wavy staff lines: Dewarped image



Sections → Glyphs → Shapes



Generated score

Rapide et joy

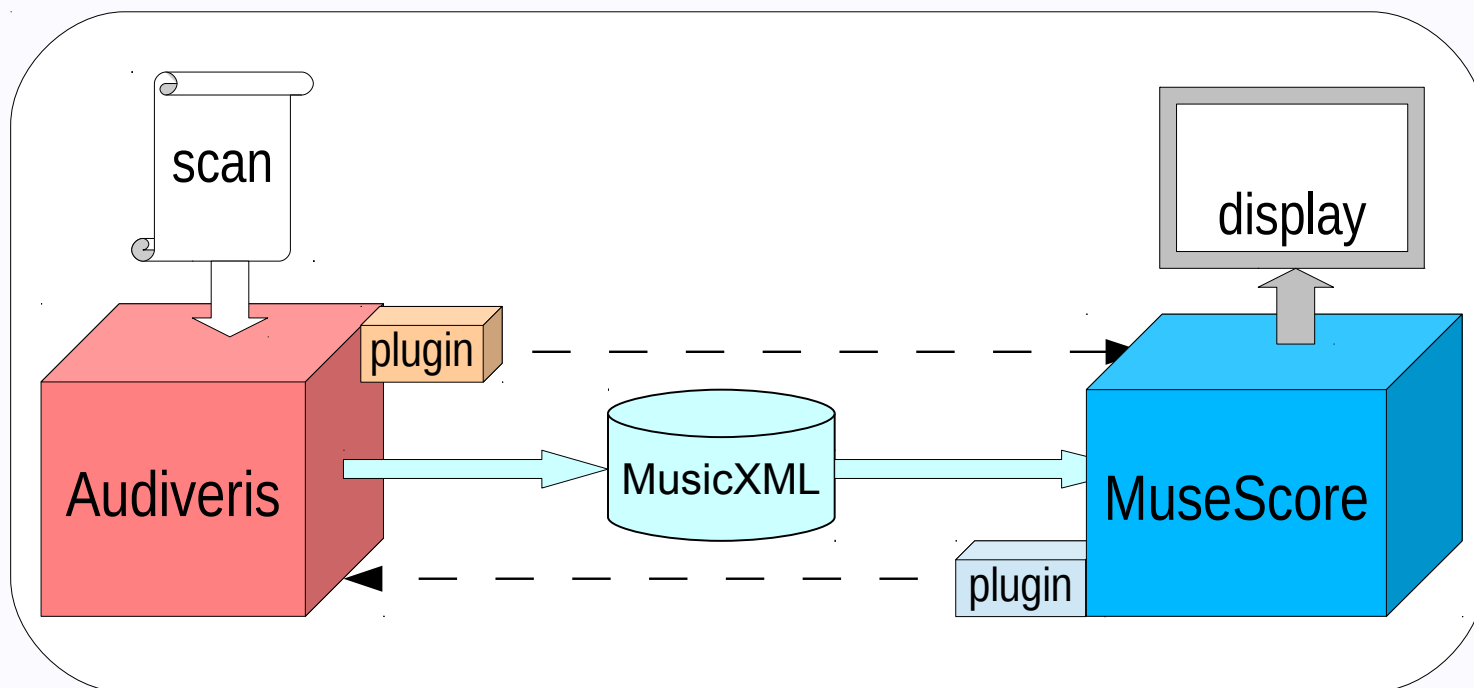
mf

AudiVeris version 4.2

- Released in December 2012
- Features:
 - ✓ Ghostscript integration
 - for PDF input
 - ✓ Adaptive Binarization
 - for non-uniform images
 - ✓ Tesseract OCR V3
 - for text handling
 - ✓ ART-based moments
 - for shape recognition
 - ✓ Plugins
 - for MusicXML consumers

Local OMR Integration

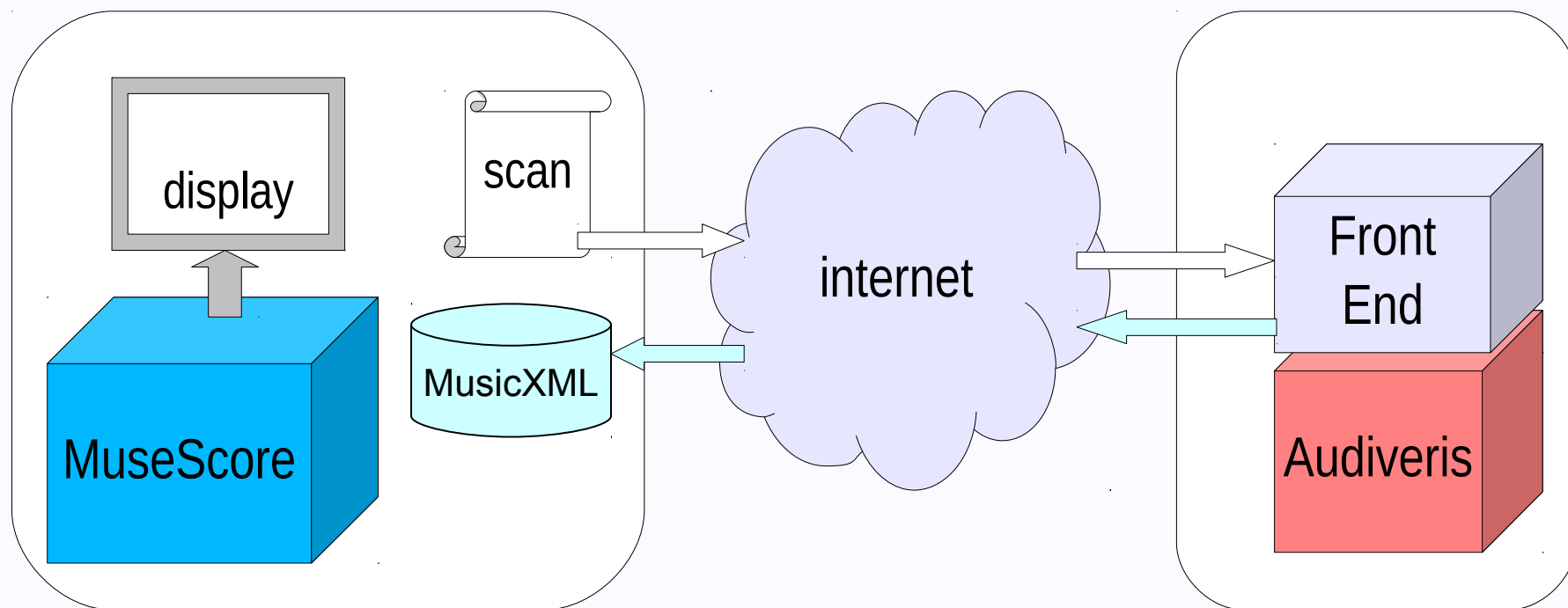
client



OMR as a Service (hack of the day)

client

server



AudiVeris evolution

- Technology
 - ✓ Good building blocks available
 - ✓ 4.2+: iterative approach OK for good-quality scans
 - ✓ 5.x: fuzzy logic needed for poor-quality scans
- Architecture
 - ✓ Focus on OMR service
- « Freemium » model
 - ✓ Free for basic features or low volume
 - ✓ Premium for more serious usage

Audiveris



Thank you

www.audiveris.org

Audiveris [latin] := « *you will have heard* »

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