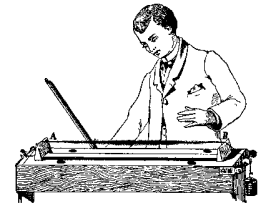




**KTH Speech, Music
and Hearing**



pDM: A tool for interactive expressive control of music performance

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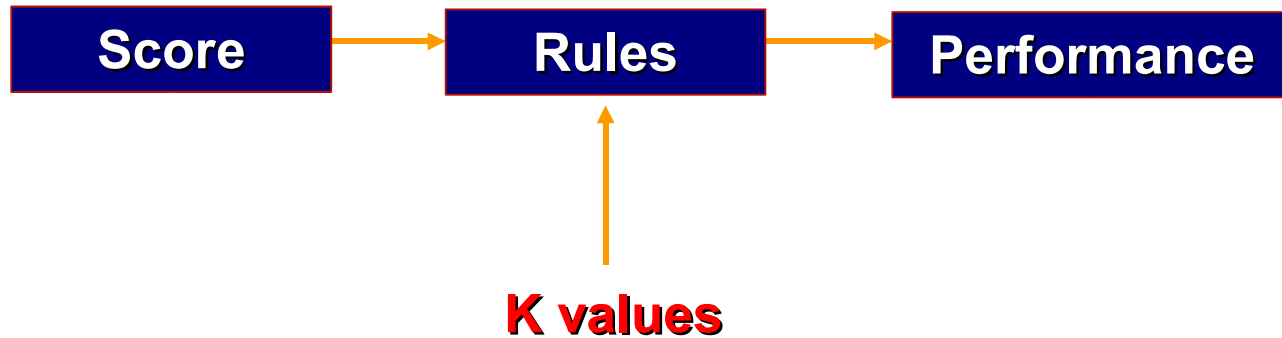
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Talk presented at the RENCON panel
session at ICMC2005, Barcelona

Background

KTH Performance Rules



- Descriptions of different performance principles used by musicians
- General applicability
- K values change the overall quantity of each rule
- Context dependency

Background

Performance Rules

Phrasing	Phrase arch Final ritardando Punctuation High loud
Harmonic/melodic tension	Harmonic charge melodic charge
Repetitive patterns and grooves	Inegales
Articulation	Punctuation Staccato/legato
Accents	Accent rule
Ensemble timing	Ensemble swing Melodic sync

Background Director Musices

A program for modelling music performance
<http://www.speech.kth.se/music/performance>

The screenshot displays the Director Musices 2.0a software interface. The main window title is "Director Musices 2.0a compiled: 25/6/1999 0:30". The menu bar includes File, Edit, Rules, Display, Play, Tools, and Help. A sub-window titled "ekor-emotions.mus" shows a table of parameters:

Type	Active	Name	Instrument type	Synth	Channel	Program	Volume
Mono-Track	<input checked="" type="checkbox"/>	V1	String	Pinnacle	1	1 Acou Grand Piano	

Below this is the "Rule palette" window, which contains a list of rules with sliders and checkboxes:

- Synchronization**
 - No-Sync
 - Melodic-Sync
- Create log**
 - log to file
 - log to score
- Scale factor: 0
- Buttons: Init&Apply, Apply
- Play performed**
- Play nominal**

The rule list includes:

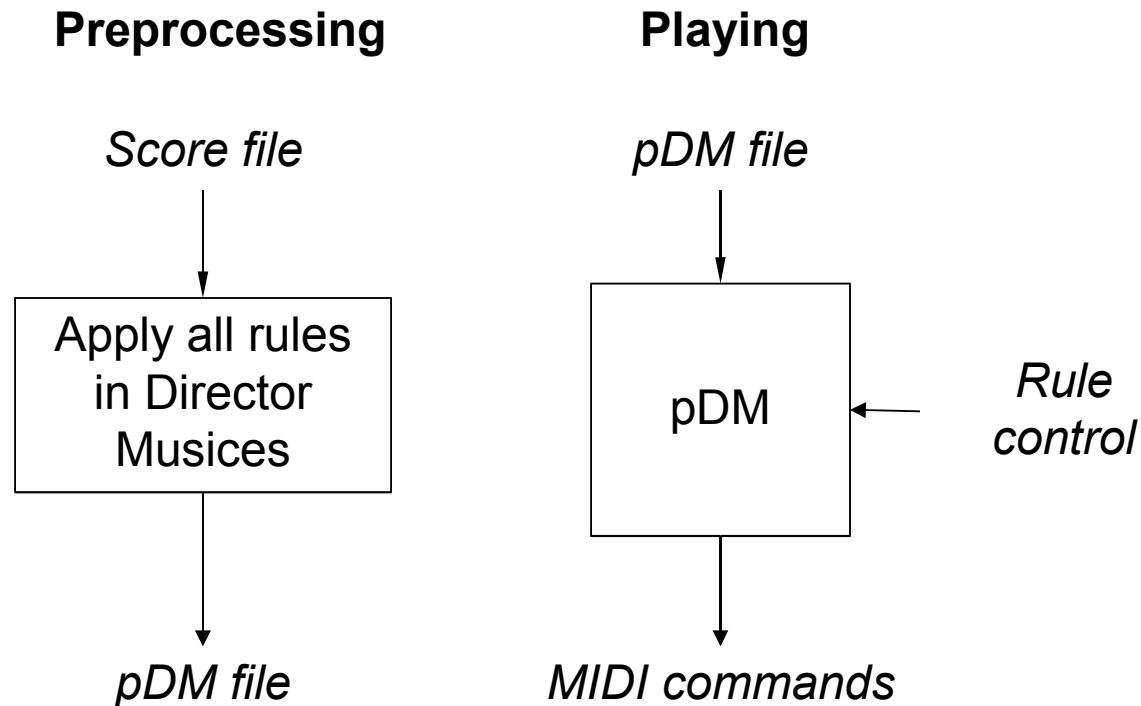
- 2.1 High-Loud
- 0.0 Melodic-Charge :Amp 1 :Dur 1 :Vibamp 1
- 0.0 Harmonic-Charge :Amp 1 :Dur 1 :Vibfreq 1
- 2.0 Duration-Contrast :Amp 1 :Dur 1
- 0.0 Duration-Contrast-Art-Dr
- 0.0 Double-Duration
- 0.0 Punctuation :Dur 1 :Duroff 1 :Markphlevel7 Nil
- 2.5 Phrase-Arch :Phlevel 5 :Turn 0.3 :Next 1.3 :Amp 2
- 0.0 Phrase-Arch :Phlevel 6 :Turn 2 :Amp 2 :Last 0.2
- Normalize-Sl
- Normalize-Dr
- 0.0 Final-Ritard

At the bottom is the "delta Duration [%]" window, which shows a line graph of delta DR [%] over time (0 to 14). The y-axis ranges from -20 to 50. Below the graph is a musical score snippet. The window also includes a "Zoom" section with "y-axis" and "x-axis" controls, checkboxes for "Square plot", "Notes", and "x-axis: ndr (dr)", and a "Redraw" button.

pDM

”A real-time Director Musices”

METHOD:



pDM – rule control window

The screenshot shows a software window titled "pdm_rule_sliders_window_selection" with a menu bar (File, Edit, Put, Find, Windows, Media, Help). The main area is titled "nominal neutral expressive" and contains a "pd rule_presets" box with three colored circles (grey, green, orange). Below this are several sections of sliders:

- k values:** A vertical stack of 20 sliders, each with a numerical value and a green bar. A thick black vertical bar is positioned between sliders 4 and 14.
- 15 Double duration:** A slider with a value of 1 and a yellow bar.
- Overall scaling:** Two sliders at the bottom: "Tempo" (value 0.98, orange bar) and "Sound level" (value 0.71, yellow bar).

On the right side, there are two columns of sliders labeled "k tempo k SL k art". The "k art" column has several sliders with values in blue boxes: 1.48, 1, 1, 1.48, and 0.

On the left side, there are four vertical labels with colored bars pointing to specific slider groups:

- Phrasing:** Blue label, points to sliders 1-7.
- Tonal tension:** Orange label, points to sliders 8-14.
- Microtiming:** Blue label, points to sliders 15-17.
- Articulation:** Orange label, points to sliders 18-19.
- Overall scaling:** Green label, points to the bottom two sliders.

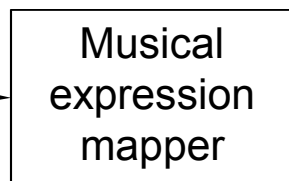
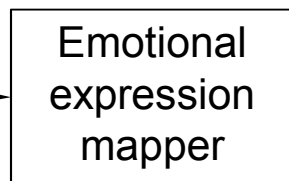
pDM expression mappers

Expressive input

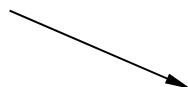
Activity-Valence
2D space



Alternative mappers

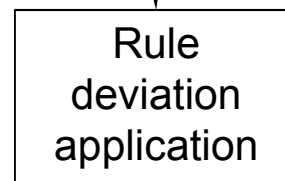


K values



Player

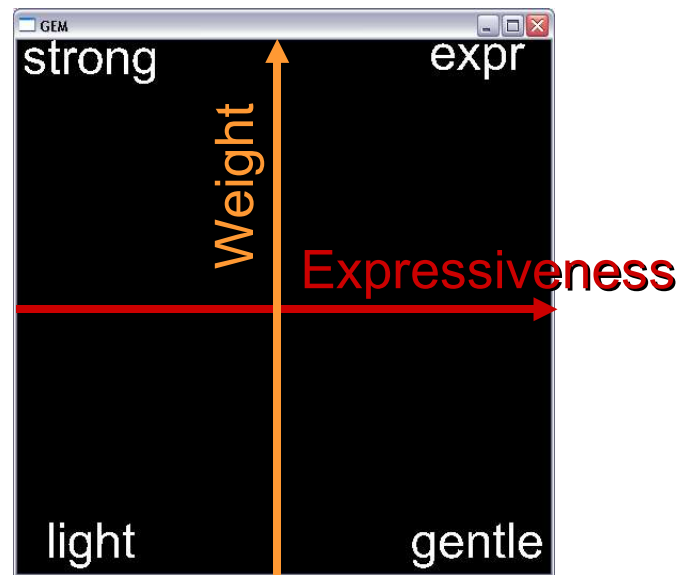
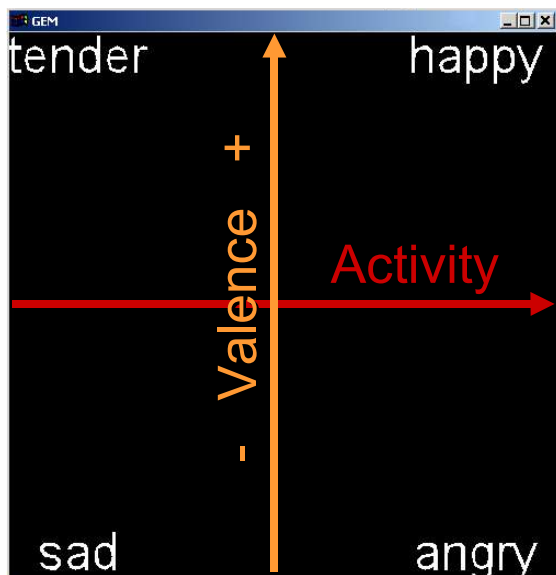
pDM Score



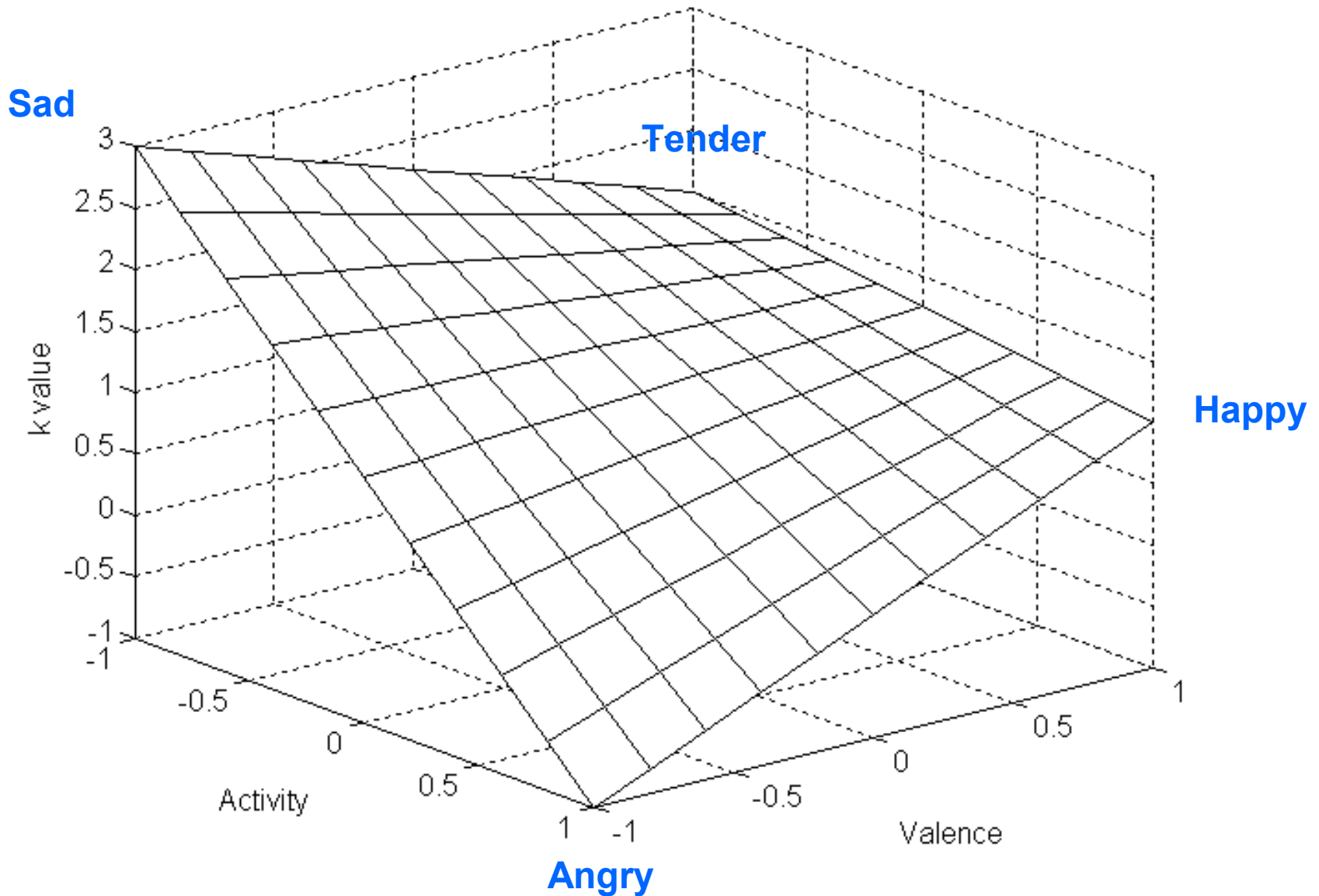
MIDI commands



Weight-Expressivness
2D space



pDM k parameter interpolation (phrase arch rule)



Home conducting – Control the overall musical expression with gestures

Ideas

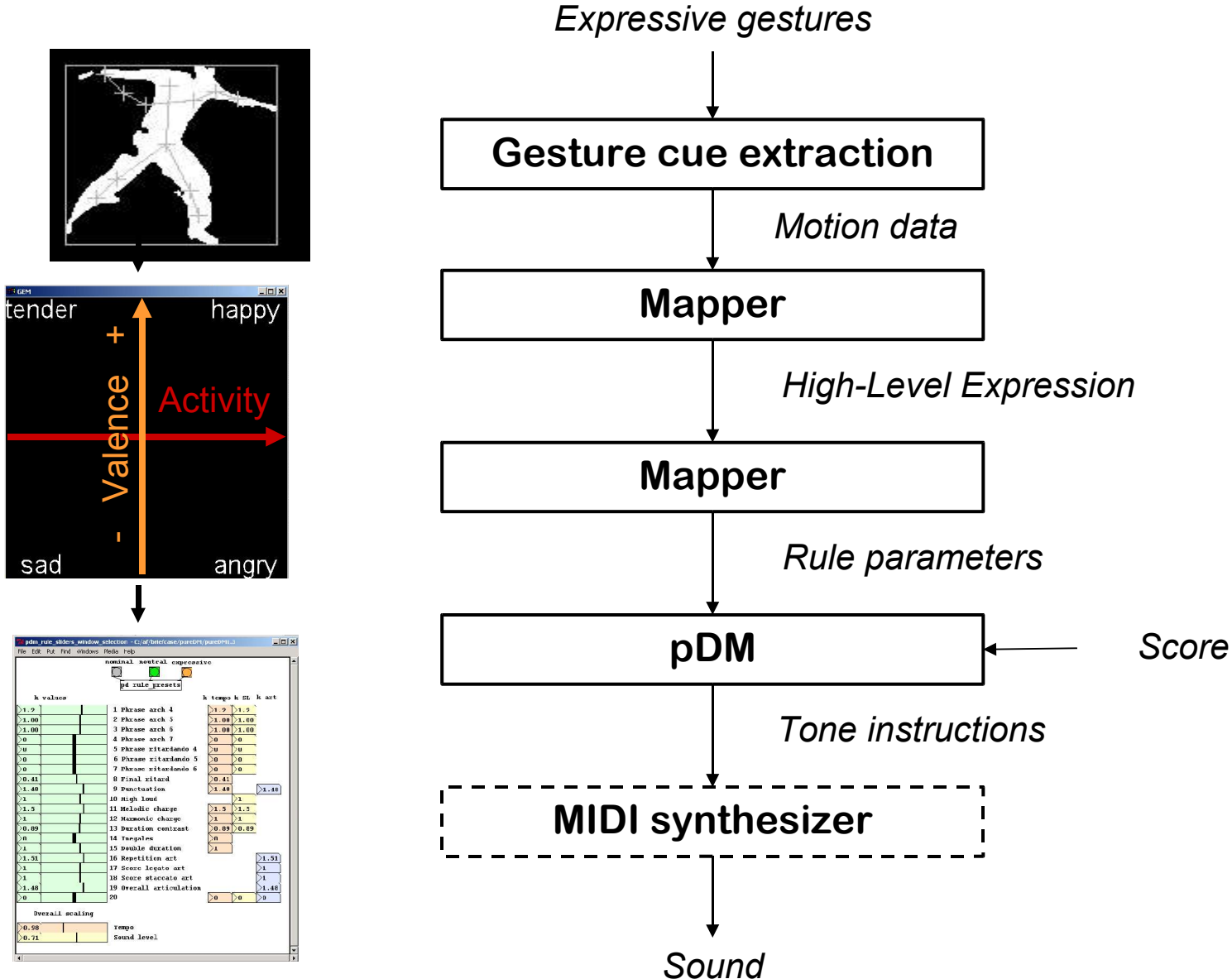
- Active listener: Instead of passive listening use gestures to control the performance in real time
- Control the general expressive features rather than only timing and dynamics
- Use different interaction levels according to the users skill

Tools

- EyesWeb video gesture analysis
- pDM – the real time version of Director Musices implementing the KTH rule system for music performance



Complete Home conductor system



Realising the Mapping

Which gestures to which parameters?

1. **Listener level**

Use basic emotional expressions in gestures to control the same musical expression (happy, sad, angry)

3. **Conductor level**

Use common musical expressions (light, heavy, expressive)

5. **Musician level**

Direct control of performance parameters (tempo, dynamics, articulation, phrasing)

→ Try listener level control at the poster!