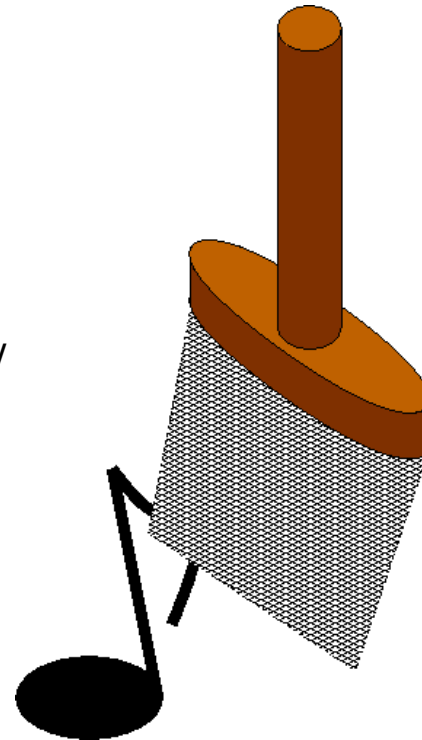


SoundPaint — Painting Music

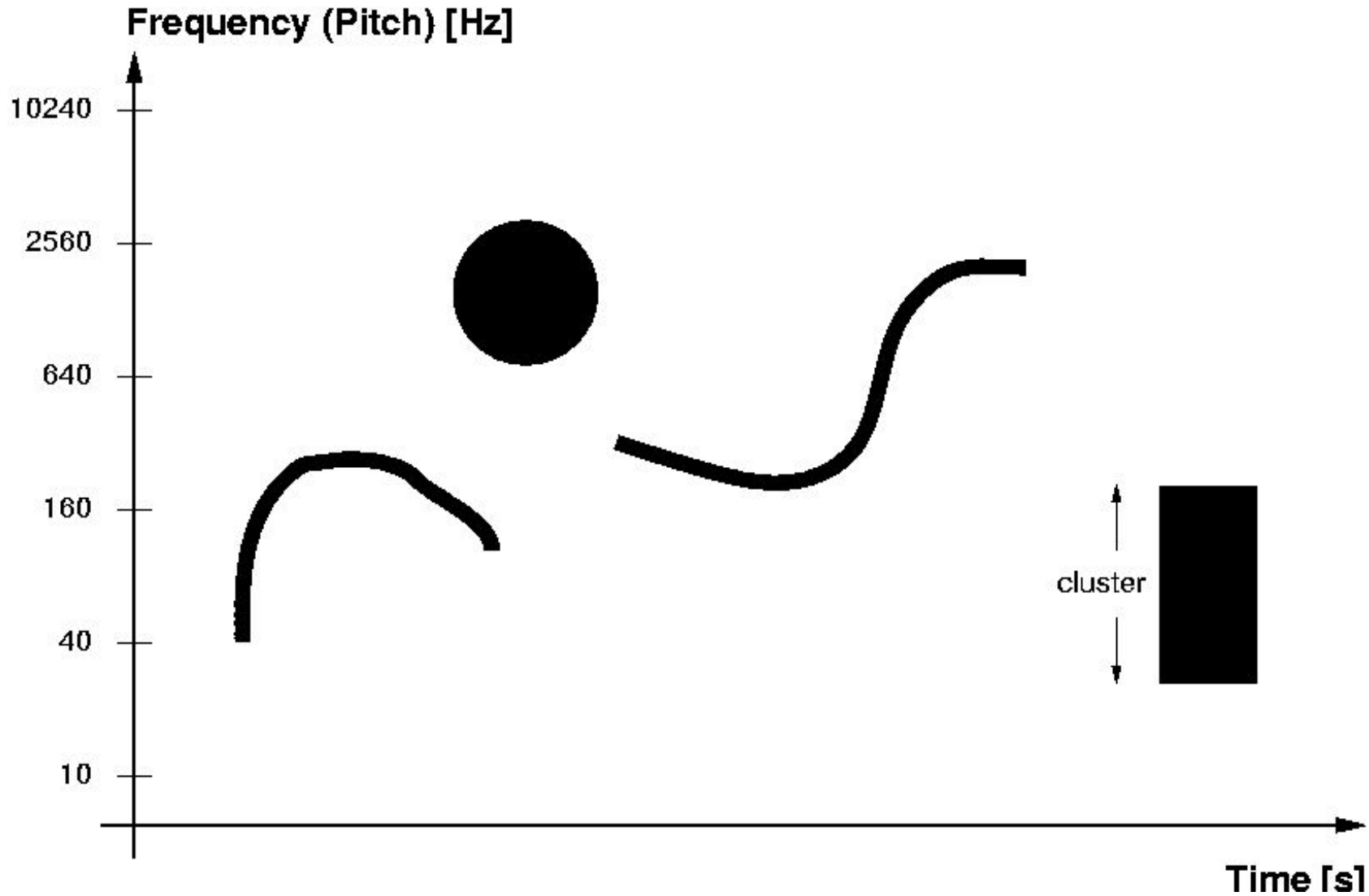
<http://www.ipd.uka.de/~reuter/soundpaint/>



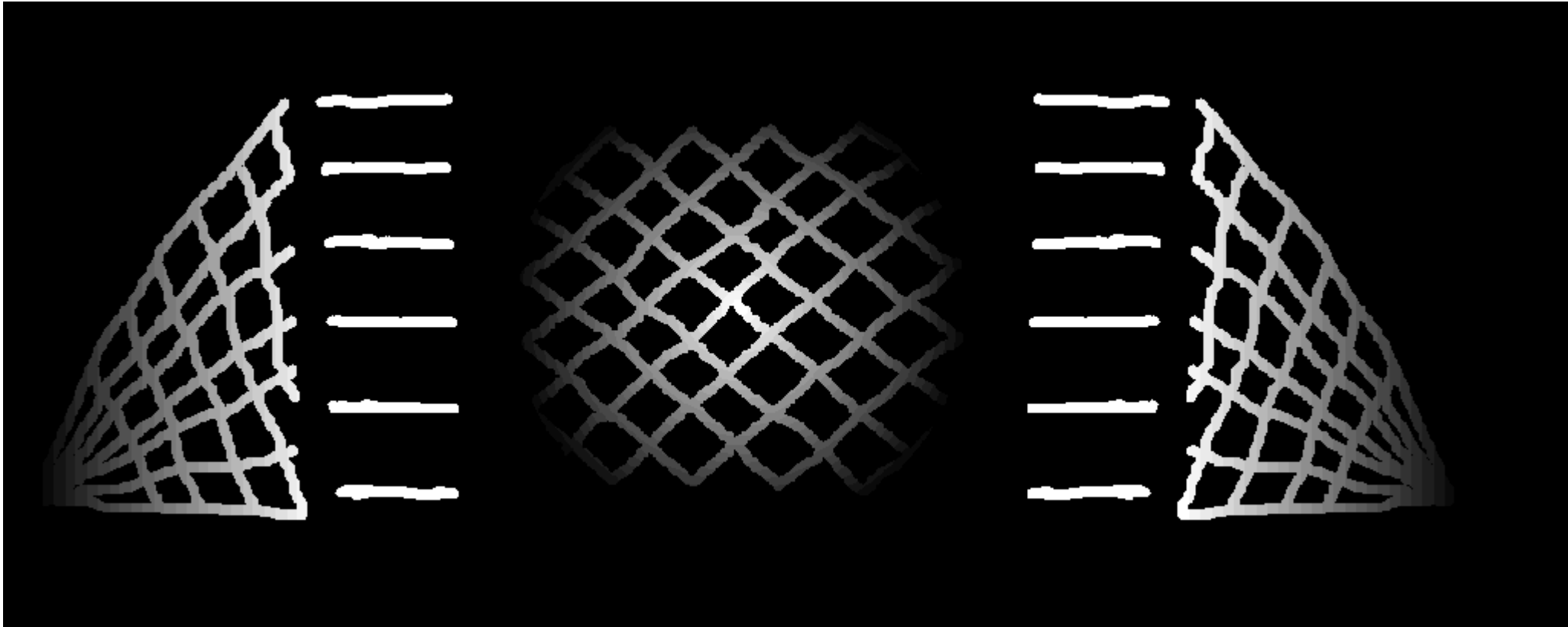
Motivation

- Integration of sound engineering & composing
- More expressive electronic music
- Graphics as input
- Stick close to graphical notation
- Simple, intuitive interface

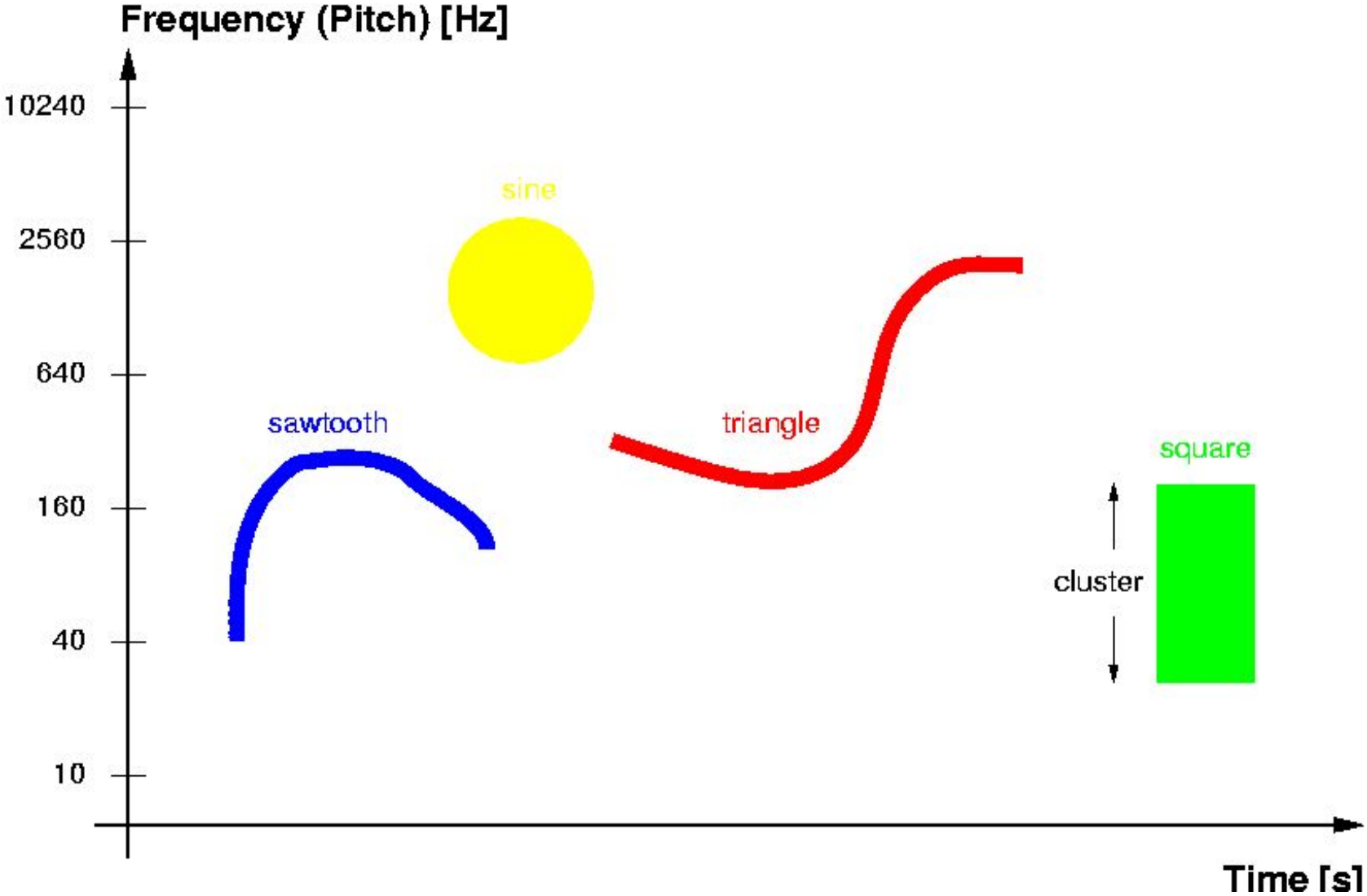
Additive Synthesis



Sound Example



Color -> Sound

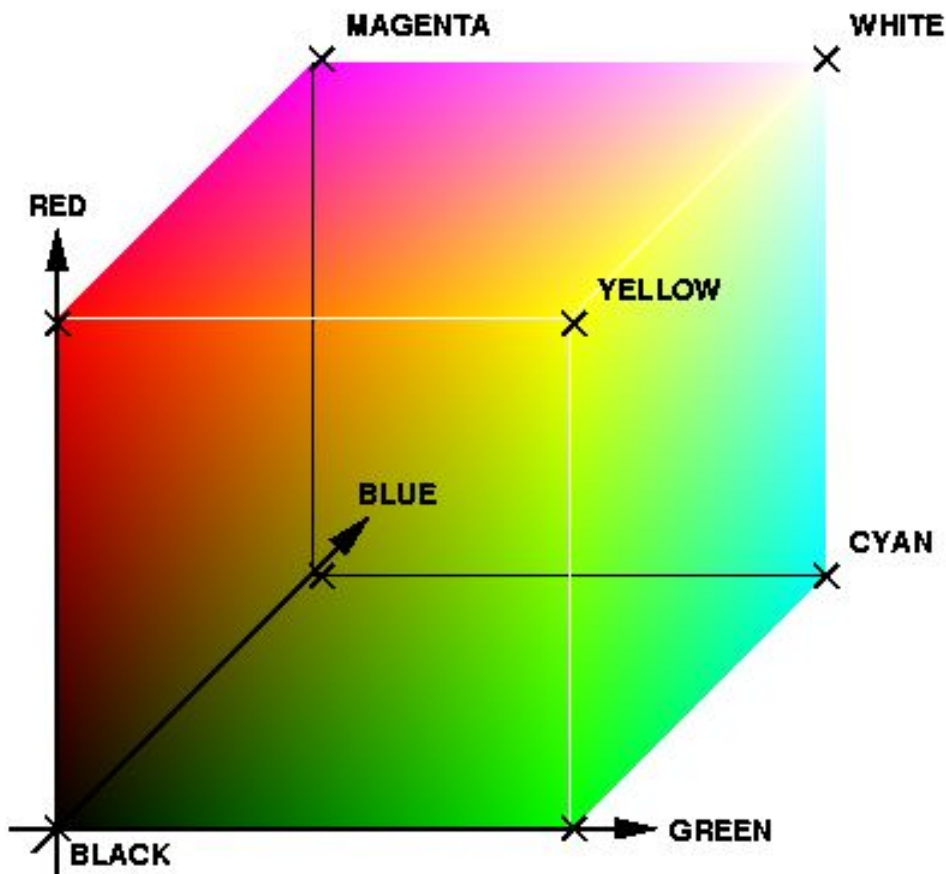


Color -> Sound Mapping Goals

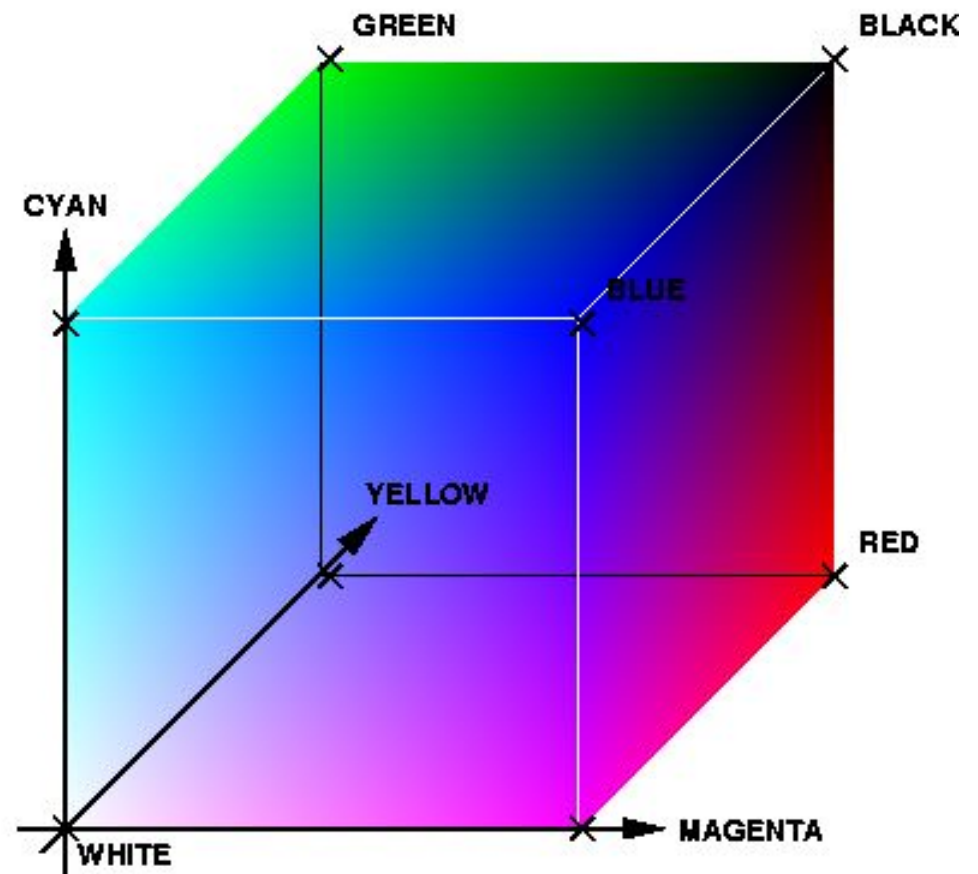
- User-definable
- Cover all colors
- Require only few data for definition
- Keep it simple (not targeted at math experts)
- Map color gradients => sound gradients

RGB Color Space

Additive



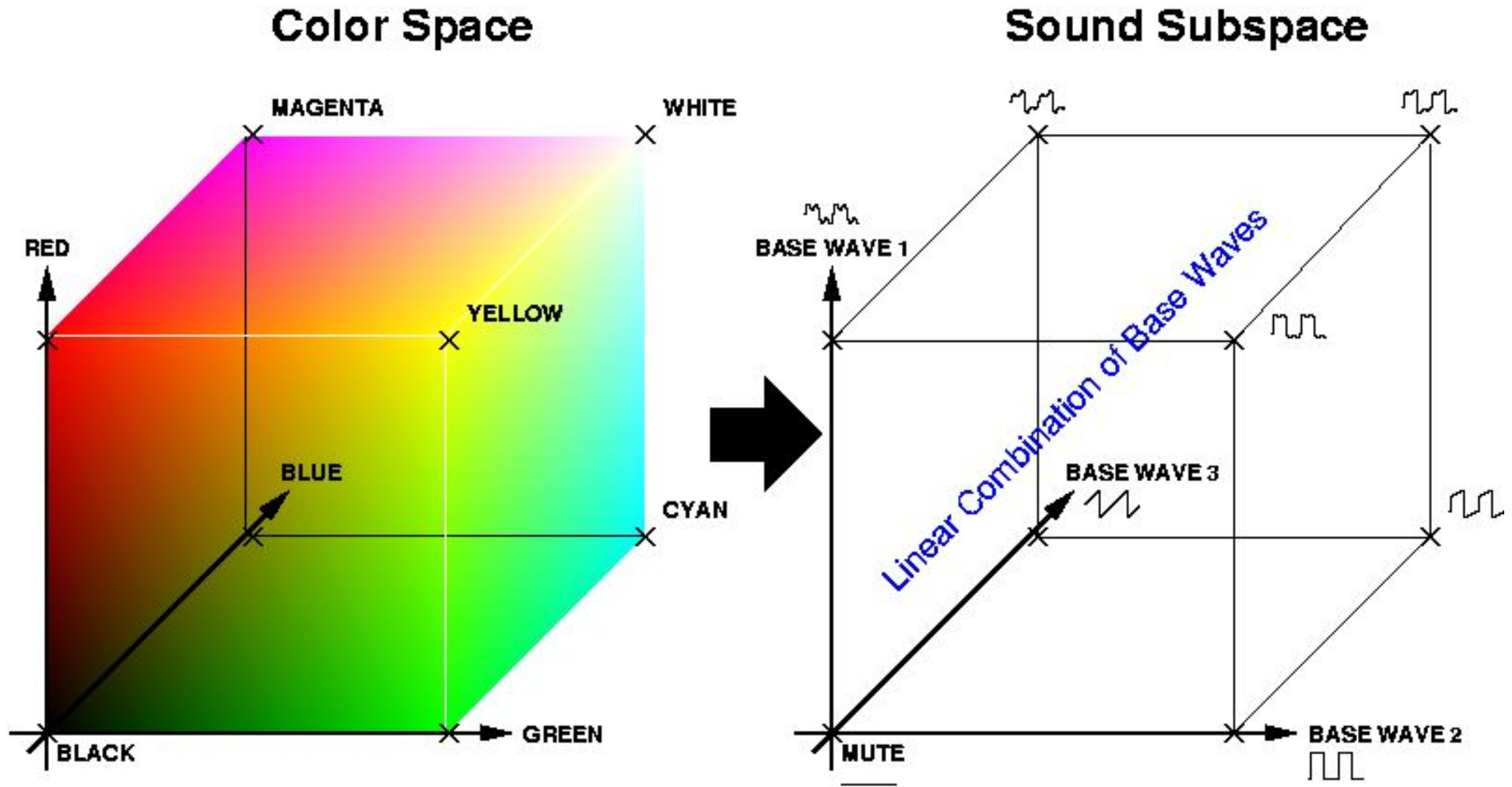
Subtractive



Color -> Sound Mapping Approach

- Problem: infinite dimensional sound space
- Idea: select 3-dimensional sound subspace
- Assign 3 colors to 3 sounds
- Interpolate all other colors
- => all goals fulfilled

Color -> Sound Mapping



Mapping Issues

- Just doing linear interpolation on wave forms
- => color gradients simply map to crossfading
- Does not sound very appealing, but just like mixing 3 sound sources
- Need rather something like sound morphing

Mapping Revisited

- Solution: add non-linear content
 - i.e. any sound parameter not controllable by crossfading
 - e.g. vibrato rate/depth, detune depth, echo speed, ...
 - only assumption: parameter can be linearly controlled, e.g. by moving a slider
- Now linearly

Generalized Mapping

- Interpolate sounds by
 - linear combining wave forms (wave form crossfading)
 - linearly interpolating sound parameters of non-linear sound content
- => get something similar to sound morphing

User Interface

The image shows two overlapping software windows. The top window is titled "Triangle Sample Editor" and contains a "Duty cycle" slider set to 73, a waveform plot showing a triangle, and an "Effects" section with sliders for "Pan" (33), "Vibrato depth and rate" (100), and "Noise" (10). The bottom window is titled "Color Settings" and contains three color selection panels: "Sound Color 2" (green) and "Sound Color 3" (blue). Each panel has a "Color" selector, a "Sample" dropdown (set to "Triangle" and "Square" respectively), and a "Sample Properties..." button. Annotations with yellow arrows point to various elements: "Wave form type specific editor" points to the waveform plot; "Generic Sound Parameters" points to the "Effects" section; "Color -> Sample Mapping" points to the "Sample" dropdowns; "Opens editor" points to the "Sample Properties..." button in the "Sound Color 2" panel; and "Wave form type selection" points to the "Triangle" dropdown in the "Sound Color 2" panel.

Triangle Sample Editor

Duty cycle: 73

Effects

Pan [0 (L) .. 100 (R)]: 33

Vibrato depth and rate: 100

Noise: 10

Color Settings

Sound Color 2

Color: [Green] Select...

Sample: [Triangle] Triangle

Sample Properties...

Sound Color 3

Color: [Blue] Select...

Sample: [Square] Square

Sample Properties...

Play Cancel Ok

Ok

Wave form type specific editor
linear interpolation of arbitrary wave forms

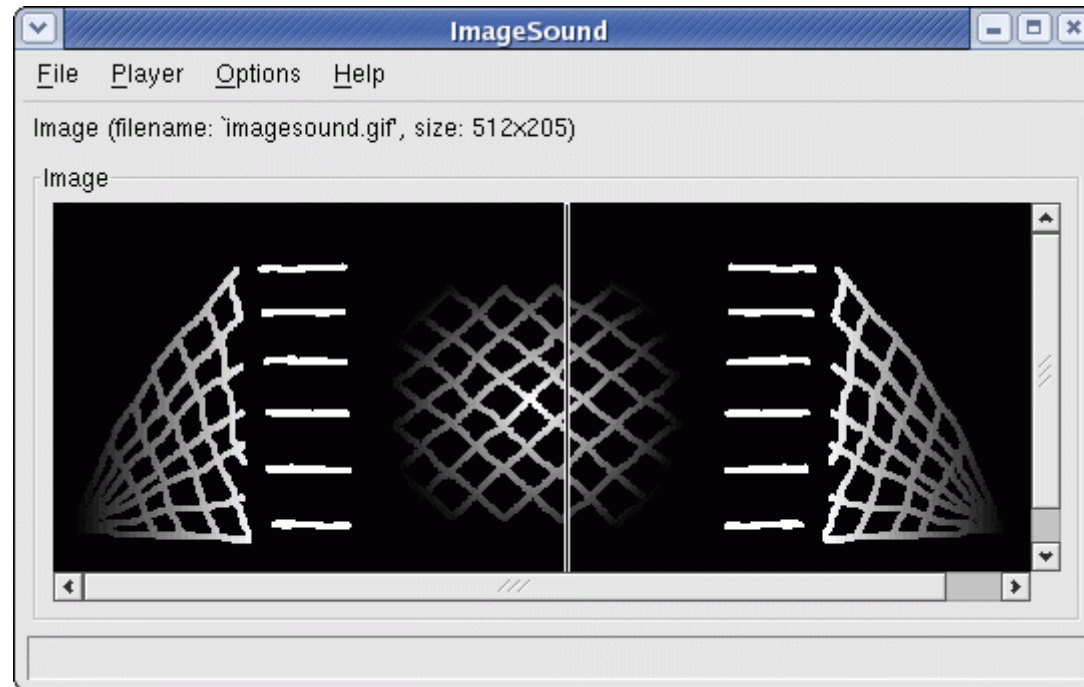
Generic Sound Parameters
linear interpolation of slider values
common for all types of wave forms

Color -> Sample Mapping

Opens editor

Wave form type selection

User Interface (cont.)



Future Work

- Subtractive colors, HSB color space
- More non-linear parameters
- Integrated graphics editor
- Real-time capabilities, DJ stuff (looping, ...)
- Raster vs. vector graphics?

Questions?