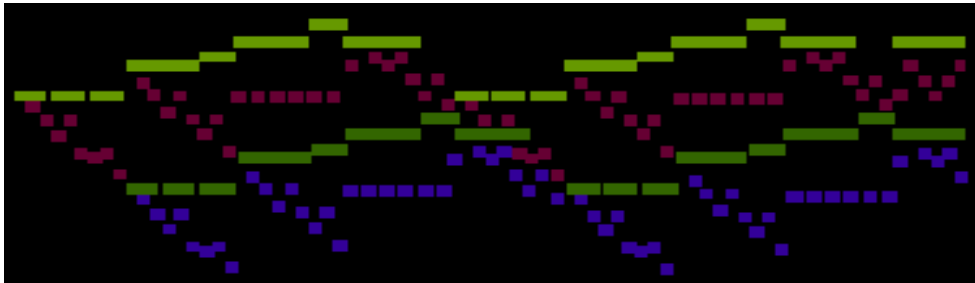


Music Animation Machine



First Demonstration Reel — Spring 1990

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Introduction — a score for listeners of all ages

Conventional music notation evolved to serve the needs of composers, performers, and conductors. By contrast, the Music Animation Machine is a musical score for *listeners*.

The Music Animation Machine (MAM) is an animated visual display that represents a musical performance. The display is synchronized with the sounds of the piece it represents.

Instead of the symbols of conventional music notation, a MAM score uses colored bars to represent the notes of a piece. The vertical placement of each bar indicates the pitch of its note, the horizontal placement indicates its timing relative to the other notes of the piece, and the length of the bar shows its duration. These bars scroll across the screen as the piece plays; when a bar reaches the center of the screen, it brightens as its corresponding note sounds. The center of the screen is always the “now” point.

A MAM score is like a conventional musical score in that it gives information about the pitch and timing of the notes of a piece. As in conventional notation, musical events at different points in the piece can be seen at once, allowing recognition of and comparison between patterns.

Unlike a conventional score, the MAM uses a single “pitch space.” In conventional notation, different instruments are distinguished by placing the notes for each instrument on its own staff. This makes it difficult to see the relationship between the notes of two instruments, since the viewer must mentally combine two or more staves into one. In MAM notation, all the notes are on the same “staff,” with different instruments indicated by color.

MAM notation shows the actual irregular timings of notes in a performance, not the mathematically exact timings of conventional notation.

The MAM notation can be colored to highlight thematic units, instrumentation, harmony, or dynamics.

MAM scores can be understood by very young children: children as young as eighteen months have demonstrated that they recognize the relationship between the sound and the visual display. Many people are visually oriented and more able to pay attention to visual objects than sounds. This may be the reason that a visual analogue to a piece of music makes it more real to children.

How to adjust your television for optimal viewing

To view this tape at its best, adjust your television as follows:

1. Go to a section of the tape that has music playing.
2. Turn BRIGHTNESS all the way up.
3. Turn BRIGHTNESS down until the background is solid black.
4. Turn COLOR all the way up.
5. Turn COLOR down until the bars of color are clear and free from smearing.

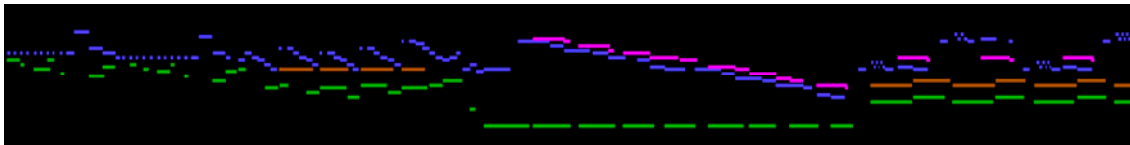
Domenico Scarlatti

Sonata, K. 96, D major

Harpsichord

Scarlatti's harpsichord sonatas contain many virtuosic keyboard "special effects."

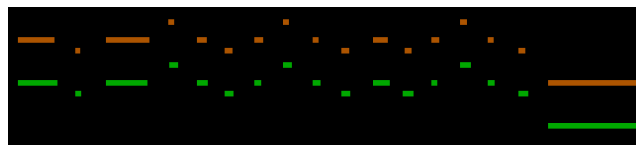
In this piece, these include: a rapid alternation of textures ...



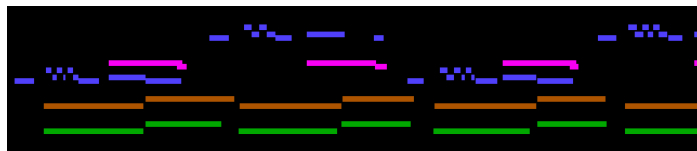
... a changing number of voices ...



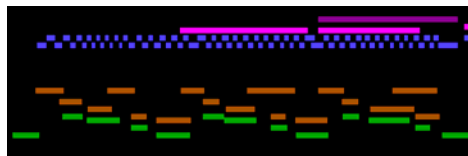
... octave doublings ...



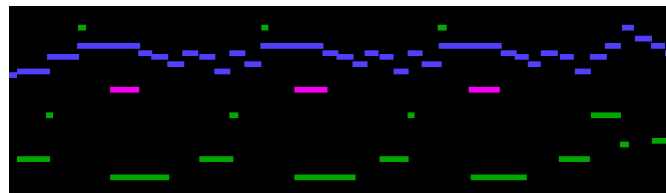
... register changes (the blue voice is jumping by an octave) ...



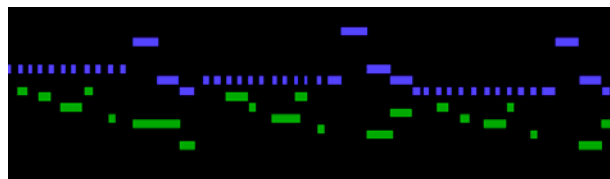
... trills ...



... hand-crossing (all the green notes are played by the left hand) ...



... and rapid repeated notes ...



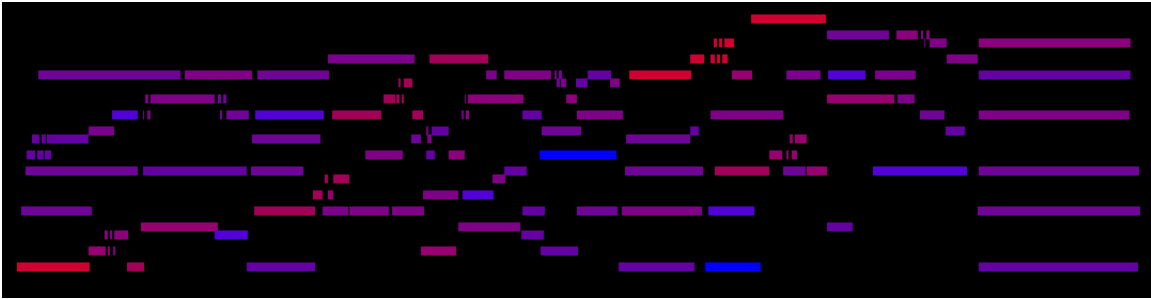
Color identifies the individual voices; often two or three voices are played by each hand.

William Byrd

A Voluntarie: for my ladye nevell

Sampled bouzouki

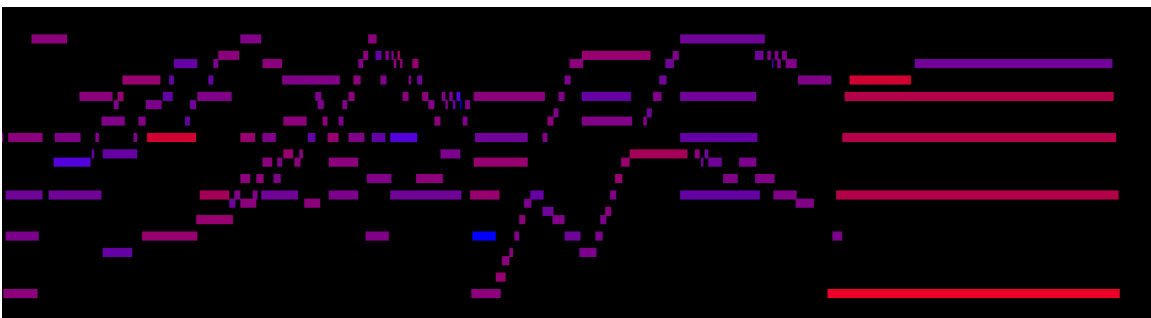
In this example, color is used to represent dynamic level: the loudest notes are the brightest red, the softest the deepest blue (shown here in the opening of the piece) ...



In many of Byrd's keyboard pieces, individual voices emerge from a chiefly chordal texture to participate in brief episodes of counterpoint. For example, here we see the three-note second theme (long note, down to a short note, then back up to another long note, etc.) brought out with slightly louder (and thus slightly redder) notes ...



The piece ends with a lot of activity, and a bang ...

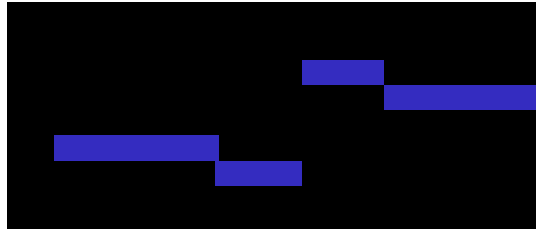


A (Greek) bouzouki sound is used as a clangorous substitute for a clavichord. Unlike the virginal (the instrument for which this piece was written) the bouzouki (and the clavichord it stands in for) is capable of bringing out individual voices through dynamic variation.

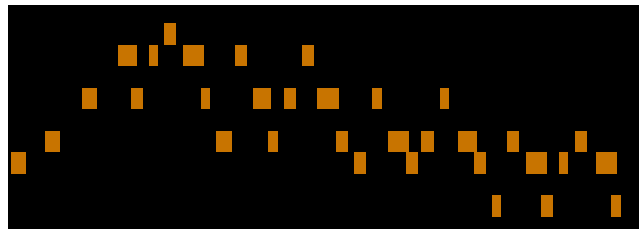
Johann Sebastian Bach Well-Tempered Clavier, Book I, Fugue 4, C sharp minor Piano

This five-voice fugue from the Well-Tempered Clavier has three themes ...

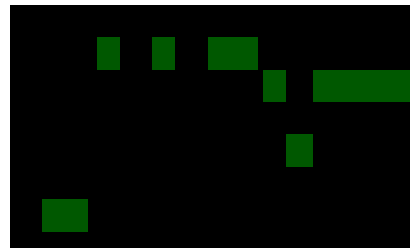
... the first, slow and abstruse ...



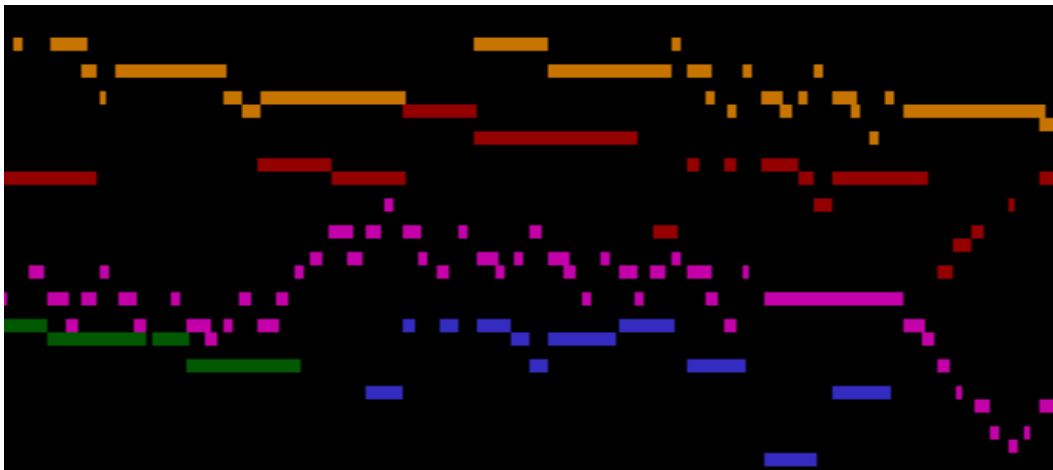
... the second, smooth and running ...



... and the third, forceful and trumpeting ...



Of course, they can all happen at the same time ...



Color identifies each of the five voices.

Johann Sebastian Bach

Brandenburg Concerto 6, third movement

Harpsichord

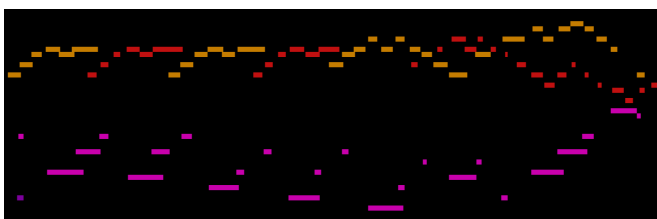
This concerto is unusual in that the solo instruments (and the highest-pitched instruments in the ensemble) are two violas — usually hidden in the middle of an orchestral texture, between the second violins and the cellos. A key feature of this movement is the contrast between the first part of the theme which is four-square and on the beat (here is the beginning, with the violas, in brown, playing the theme in unison) ...



... and the second half of the theme which is syncopated (the violas are ahead of the beat) ...



The solo sections often begin with the two violas trading off snippets of fast passage-work ...



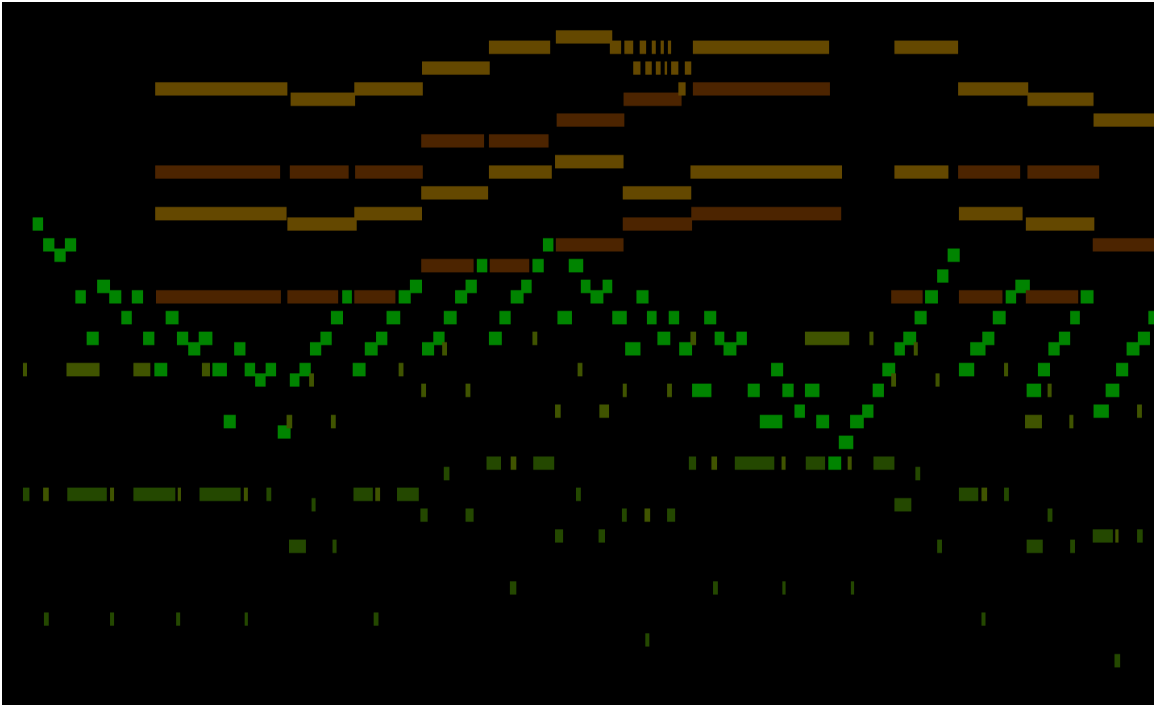
... but soon, while one viola continues the fast stuff, the other returns to the syncopated figure from the main theme ...



Color identifies the six voices.

Johann Sebastian Bach
Herr Gott, nun schleuss den Himmel auf
Pedal harpsichord

Do we see in this chorale prelude, “Lord God, now unlock the Heavens,” the attempts of the running tenor voice (shown here in green) to reach the heavens, alternately climbing up and toppling down?



This piece, written for organ, is notated in four voices. In this rendition on pedal harpsichord, the soprano, alto and bass voices are doubled in octaves to give the effect of multiple organ stops.

Color identifies the four voices.

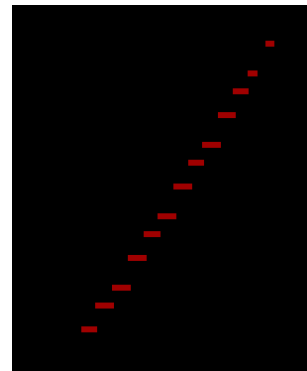
Ludwig van Beethoven

Bagatelle, opus 33, no. 5

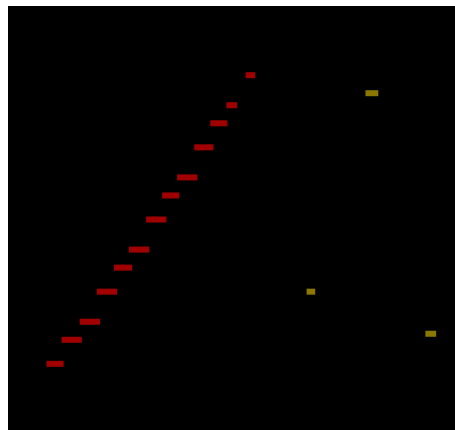
Piano

A *bagatelle* is a kind of musical trifle, a short, often light-hearted piece. Beethoven wrote many of these, often as preliminary explorations of musical ideas he later incorporated into longer, more serious works. However, Art Weber has suggested that in the case of this particular piece, Beethoven might have been thinking of another meaning of the word: in his time, “bagatelle” also referred to the mechanical game we now call pinball.

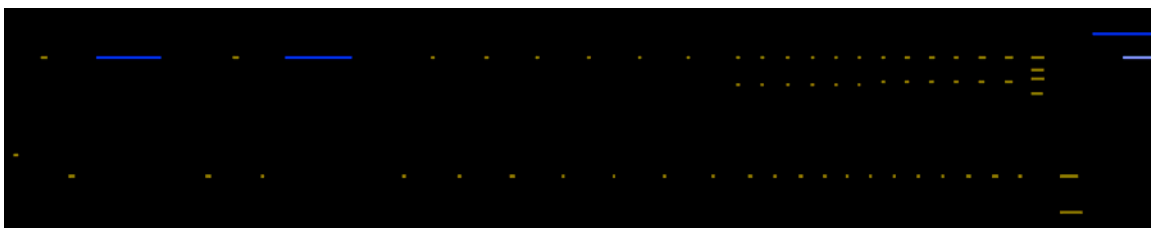
Is the opening theme an imitation of a ball being launched ...



... followed by a couple of bounces ?



Toward the end of the piece, it even sounds as if a ball has gotten stuck and the player is trying to shake it loose ...



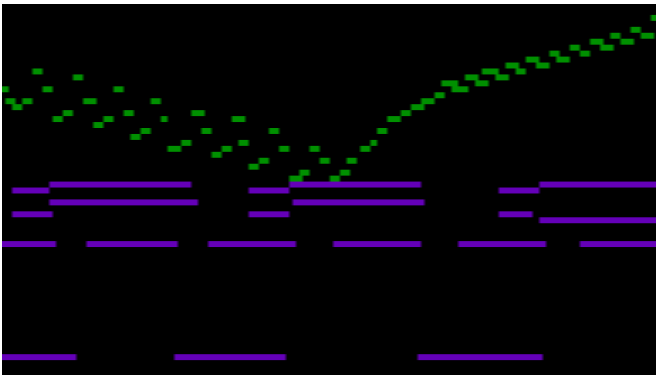
In this rendition, color is used to demarcate different types of textural material.

Frédéric Chopin
Berceuse, opus 57
Piano

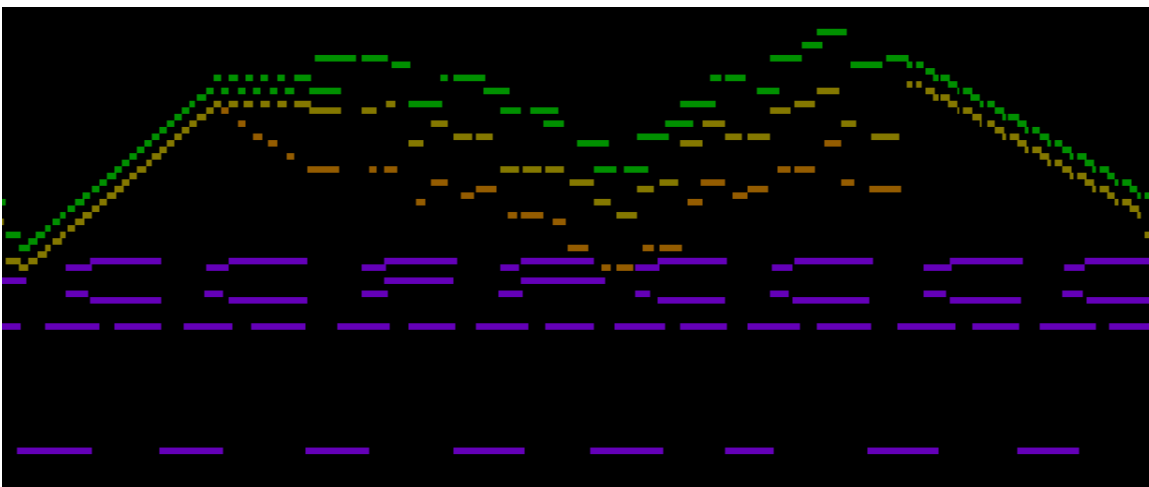
The left-hand part of this lullaby rocks between tonic and dominant ...



while the right hand engages in all manner of delicate figuration ...



Color indicates melodic voices — sometimes more than one per hand ...

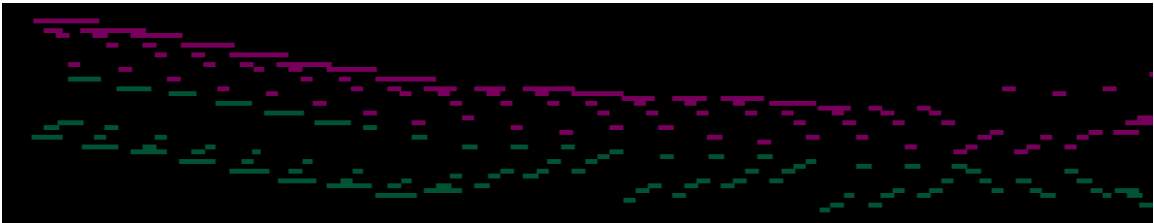


Frédéric Chopin
Etude, opus 10, no. 8
Piano

This etude is characterized by right-hand arpeggios that span several octaves (here is the opening) ...



Later on in the piece, the left hand also gets “a piece of the action” ...



Coloring distinguishes left and right hands.

Fred Kasper Palindrome Canon Piano

In Kasper's ingenious piece, everything that's played at one time by the right hand is played at another time in the left hand, and everything that's played forward is played backward.

Here is a picture of the whole piece ...



Notice that the first right hand section ...



... is the same as the final left hand section ...

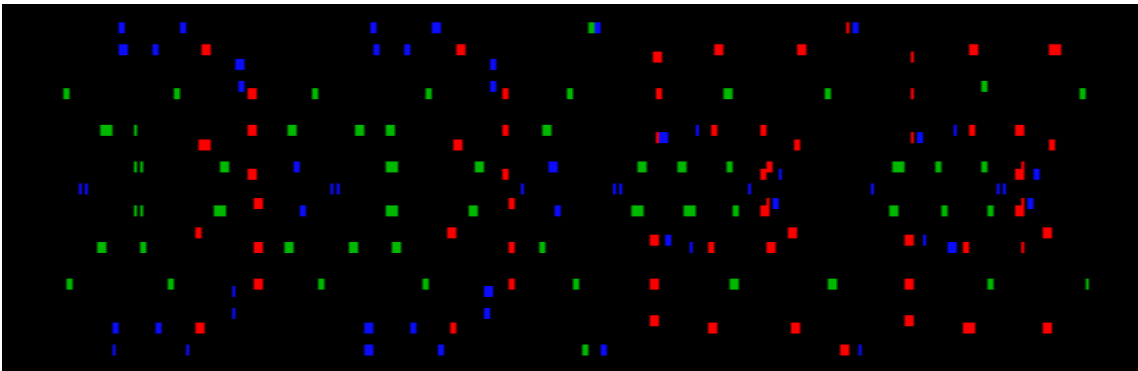


The entire piece is built upon such symmetries.

Color shows which hand is playing.

Anton Webern
Variationen, opus 27, no. 2
Piano

Like the previous one, this piece is about symmetry, but in a different way: a mirror symmetry with respect to the horizontal midline. Here is the entire piece ...



Also, the symmetry extends to dynamics, which are indicated by color ...

ff fortissimo

f forte

p piano

Stephen Malinowski
“Wedding” Etude
Piano

The effect of piano pedaling is salient in this piece. As the thickness of sound accumulates, the colored bars seem to “stack up,” until the pedal is released, ending them all at once ...



The name “wedding” comes from this quote (from Mendelssohn’s *Wedding March*) in the middle section of the piece ...



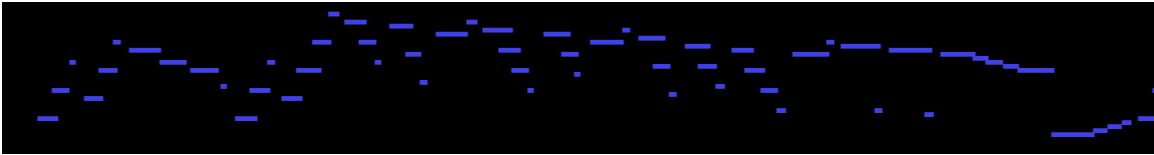
Color indicates voices — sometimes more than one per hand.

Stephen Malinowski

Fantasy in F

Piano

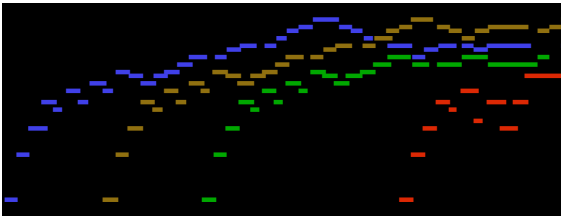
Most of the melodic and harmonic material of this piece is built from perfect fourths and fifths. The piece opens with a left-hand pattern built from rising fifths and falling fourths ...



This pattern serves as an ostinato, which repeats a couple of times with right-hand chords also built on fourths and fifths ...



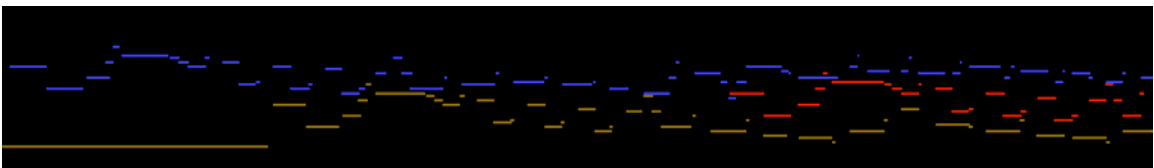
The piece explores various kinds of imitation; here's the first, a follow-the-leader ...



... after the first cadence (on a chord of stacked fifths), there's a two-part canon ...



... and a three-voice fugue ...

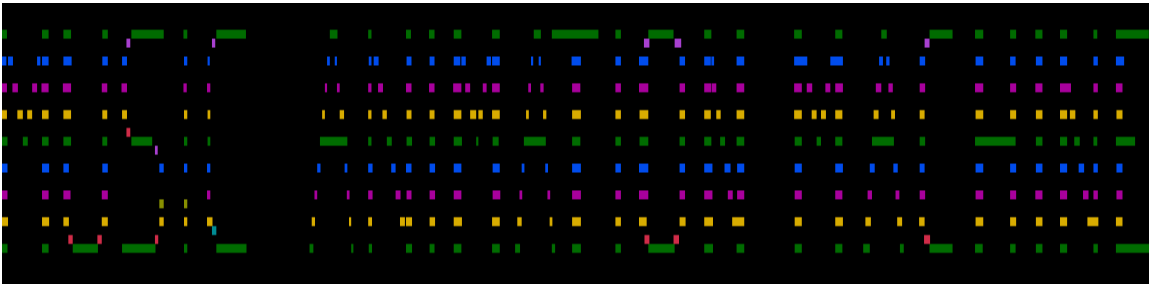


Color shows voices, changes in texture, and sections of the piece.

Additional resources ...

... can be found at the MAM web site:

www.musanim.com



(another piece by Fred Kasper)

Stephen Malinowski, April 2011