

Taproot

for solo bass

3'

Andrew S. Allen

Taproot is notated in Tabs.

Accidentals indicate general location on the string.

A sharp sign means to play a note somewhere around the high end of the string.

A natural sign means to play a note somewhere in the middle of the string.

A flat sign means to play a note somewhere around the low end of the string.

If repeating notes on the same string, always change the position so each note is a different pitch. Microtonality is appreciated.

Using a horn plectrum is preferred, but any thick pick will do.

Each line is labeled with a letter and a number. The player may play the letters in any order, as long as the numbers are in order. For example: B1 A1 C1 A2 C2 B2 D1 D2 B3 C3 is acceptable. B3 A2 C3 A1 C1 B2 D1 D2 B1 C2 is not.

This piece uses a compound parabolic function that maps all the parameters of the composition to the same contour with different quantizations.

The compound has three components, a function for exponential or x-intercept vertexes, a function for logarithmic or y-intercept vertexes and a function for linear equations.

Exponential: $y = a(x-h)^2+k$

Logarithmic: $x = a(y-h)^2+k$

Linear: $y = mx+b$

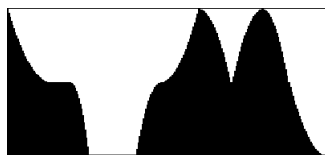
where y = the parameter value, x = the number of events, h = a constant zero, k = a constant zero, a = the width of the parabola, determined by the amount of events and range of parameter values.

A program to generate a series of evenly-spaced, quantized values from these functions to produce a list of values that approximate the pure contour. The contour program receives four-numbers arrays, the values coincide with start value, end value, function-type, and the percentage of the total number of quantized events to produce from that function.

The contour used in this piece is generated from a user-input total event number and the program then determined the percentages and the number of events for each function to produce. The following list sends appropriate information to the function generators. The function-type is either 1 (exp), 0 (lin) or -1 (log).

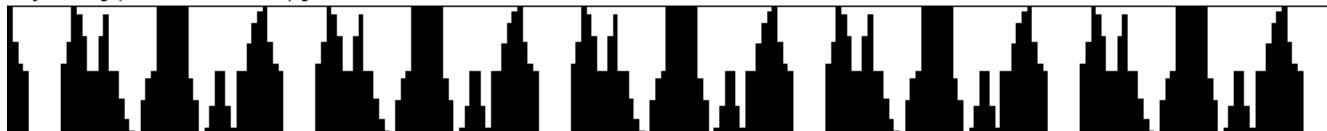
| 1 .5 1 14% | .5 .5 0 6% | .5 0 -1 6% | 0 0 0 14% | 0 .5 -1 8% | .5 1 1 12% | 1 .5 -1 10% |
 | .5 1 -1 10% | 1 .5 -1 8% | .5 0 1 12% |

Which produces the "pure contour":

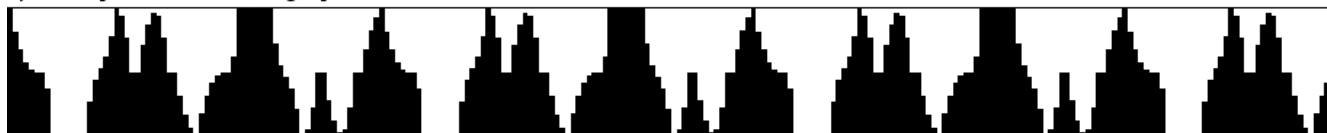


The total number of events for each parameter contour:
 rhythm: 25 (5²), "pitch": 36 (6²), string #: 49 (7²), dynamic: 64 (8²).

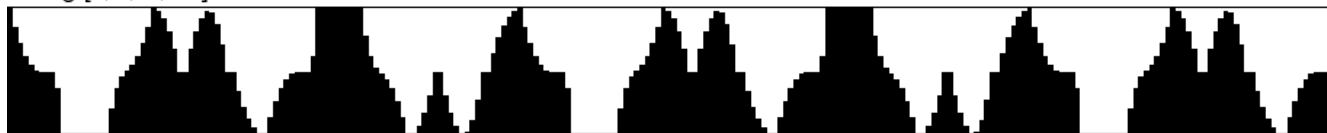
rhythm [(from rh-funcs)]



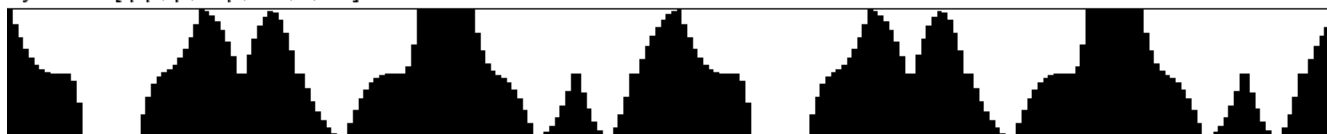
"pitch" [low, middle, high]



string [I, II, III, IV]



dynamic [pp, p, mp, mf, f, ff]



A note-event is generated by looking up the (y-value) from the x-value (event number modulo the total number of events in that parameter) for each parameter contour. This process generates a list of information. An excerpt is shown here:

r5 s IV ff
 r4 s IV ff
 r3 n III f
 r3 n III f
 r1 n III mf
 r1 n III mf
 r1 n III mf
 r1 n III mf
 r1 f III mf
 r1 f II mf

Row 1: Rhythmic division/duration, Row 2: "Pitch", Row 3: String #, Row 4: Dynamic

The piece uses 250 events. Each system has 25 events. Each system is subject to a different set of rhythmic divisions.

The rhythmic divisions are as follows:

	r1	r2	r3	r4	r5
A	Whole-note (1)	Half-note (2)	Quarter-note (4)	Eighth-note (8)	16th-note (16)
B	2	4	6	8	10
C	1	2	3	4	5
D	3	5	7	9	11

The rhythm is determined by "rhythmic-division-sets", which use three numbers to describe a type of rhythmic division: (t f o)

The three numbers are: t = function-type, f = factor, o = offset.

The equation is as follows:

where r = rhythmic-division-set, t = operation type and if t = 0, then operation-type = "+", if t = 1, then operation-type = "x", if t = 2, then operation-type = "^":

$$r(n) = (f [t] n) + o, \text{ when } n = 0 \text{ to } 4$$

Using the example set (2 2 0):

$$r(n) = (2 ^ n) + 0, \text{ where } n = 0 \text{ to } 4$$

evaluated:

$$\begin{aligned} r(0) &= 1 \\ r(1) &= 2 \\ r(2) &= 4 \\ r(3) &= 8 \\ r(4) &= 16 \end{aligned}$$

, which is the first rhythmic-division-set ("A").

Rhythms that produce anomalies in division: for example, a series of durations such as: 9 11 7 5 7 11 3 1 11 1 etc. are quantized so that the divisions can be segmented at either the half-note or whole-note.

Taproot

Andrew S. Allen (ASCAP)

for solo bass

moderately quick and deliberate

sempre pizz., using fingernail or large, thick plectrum

The musical score for "Taproot" is presented in 12 sections, each with guitar tablature (TAB) and dynamic markings. The sections are:

- A1:** Starts with a forte (*ff*) dynamic, moving to *f* and then *mf*. It features a series of notes with a *pp* dynamic marking.
- B1:** Begins with a piano (*p*) dynamic, followed by a *ff* dynamic. It includes triplets and a *sub. mf* marking.
- A2:** Starts with *mp* and *pp*, then moves to *mf*, *f*, and *ff*.
- C1:** Features *mf* dynamics with triplets and a *pp* dynamic.
- B2:** Starts with *p* and *mf*, then *ff*, and ends with *mf* and *pp*.
- C2:** Begins with *pp*, then *mf*, *f*, and *ff*.
- B3:** Starts with *mf* and *ff*, then *mf* and *pp*.
- D1:** Features *mf* dynamics with a *ff* dynamic and a *pp* dynamic.
- C3:** Starts with *mf* and *pp*, then *mf*, *f*, and *ff*.
- D2:** Begins with *mf* and *pp*, then *mf*, *f*, and *ff*.

The score includes various musical notations such as triplets, slurs, and dynamic hairpins. The key signature has one sharp (F#) and the time signature is 4/4.